

Forest Carbon Partnership Facility (FCPF)
Carbon Fund

Emission Reductions Program Document (ER-PD)

ER Program Name and Country: Atiala Atsinanana Emission Reduction Program,
Madagascar

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General information on completing the ER-PD

Purpose of the ER-PD

ER Programs that have been included in the pipeline of the FCPF Carbon Fund are expected to provide detailed information on the design of the ER Program using the template provided in this document. By completing and sending the ER Program Document, a REDD Country Participant or its authorized entity officially submits the ER Program to the Carbon Fund.

The ER Program Document, in combination with other documents such as the country's Readiness Package, provides the information required by the Carbon Fund Participants to decide whether to proceed to negotiating an ERPA for the proposed ER Program.

One type of information that ER Programs are expected to provide in order to be considered in the FCPF Carbon Fund, is a demonstration of conformity with the FCPF Carbon Funds' Methodological Framework. This Framework contains a set of criteria and indicators (C&I) that will be used by Carbon Fund Participants to select ER Programs. The ER-PD will assist ER Programs to provide information on how it meets the criteria and indicators of the Methodological Framework and it will assist review by the Carbon Fund. For ease of reference, and where applicable, the sections in this ER-PD refer to the corresponding criteria specified in the MF.

The Methodological Framework contains a glossary which defines specific terms used in the Methodological Framework. Unless otherwise defined in this ER-PD template, any capitalized term used in this ER-PD template shall have the same meaning ascribed to such term in the MF.

Guidance on completing the ER-PD

Please complete all sections of this ER-PD. If sections of the ER-PD are not applicable, explicitly state that the section is left blank on purpose and provide an explanation why this section is not applicable.

Provide definitions of key terms that are used and use these key terms, as well as variables etc, consistently using the same abbreviations, formats, subscripts, etc.

The presentation of values in the ER-PD, including those used for the calculation of emission reductions, should be in international standard format e.g 1,000 representing one thousand and 1.0 representing one. Please use International System Units (SI units – refer to http://www.bipm.fr/enus/3_SI/si.html) and if other units are used for weights/currency (Lakh/crore etc), they should be accompanied by their equivalent S.I. units/norms (thousand/million).

If the ER –PD contains equations, please number all equations and define all variables used in these equations, with units indicated.

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ACRONYMS AND DEFINITIONS

AFD	French Development Agency
AFOLU	Agriculture, Forestry, and Other Land Use
AGB	Above Ground Biomass
AP	Protected Area
BGB	Below-Ground Biomass
BIF	Local Tenure Office
BNC CC	National Coordination Office for Climate Change
BNC REDD+	National Coordination Office for REDD+
BRC REDD+	Regional REDD+ Coordination Office
CASEF	Agricultural Growth and Property Security
CAZ	Ankeniheny-Zahamena Corridor
CDM	Clean Development Mechanism
CF	Carbon Fund
CI	Conservation International
CIME	Interministerial Environmental Committee
CIREEF	Constituency of Environment, Ecology and Forests
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
COAP	Protected Area Code
COBA	Basic community
COP	Convention of Parties
COFIL	Steering committee
COFIL REDD+	REDD+ Steering Committee
CSO REDD+	REDD+ Civil Society Organization
CSR	Corporate Social Responsibility
CTD	Decentralized local authority
DMNF	Deforested Modified Natural Forest
DNA	Designated National Authority
DPF	Deforested Primary Forest
ECM	Executive Committee
EIA	Environmental Impact Assessment
ERPA	Emission Reductions Payment Agreement
ER-PD	Emission Reductions Program Document
ERs	Emissions Reductions

ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESO	Environmental and Social Officer
FAPBM	Foundation for Protected Areas and Biodiversity of Madagascar
FCPF	Forest Carbon Partnership Facility
FDA	Agricultural Development Fund
FDL	Local Development Fund
FF	Functional Framework
FGRM	Feedback and Grievance Redress Mechanism
FMT	Facility Management Team
FRA	Forest resource Assessment
FRDA	Regional Agricultural Development Fund
FREL	Forest Reference Emission Level
FTM	Malagasy center of maps
GCF	Community Forest Management
GDP	Gross Domestic Product
GEF	Global Environment Facility
GELOSE	Secure local resource management-grassroot governance
GFOI - MGD	Global Forest Observations Initiative Methods and Guidelines
GFW	Global Forest Watch
GIZ	German Development Cooperation
GM	Grievance Mechanism
GMC	Carbon Methodology Group
GRM	Grievance-Redress-Mechanism
GTS	Technical Group on Safeguards
IEFN / IFN 96	National Forest Ecologic Inventory
INDC	Planned Contribution Determined at National Level
INSTAT	National Institute of Statistics
IPCC	Intergovernmental Panel on Climate Change
ITTC	International Tropical Timber Convention
KASTI	Committee on Forestry and the Environment
LRA	Applied research laboratory
LULUCF	Land use, land-use change and forestry
MAEP	Ministry of Agriculture, Livestock and Fisheries
MBG	Missouri Botanical Garden
MECIE	Consistency of Investments with the Environment
MEEF	Ministry of Environment, Ecology and Forest
MERPA	Madagascar ER-P Area
MF	Methodological Framework (FCPF)

MFB	Ministry of Finance and Budget
MNF	Modified Natural Forest
MOPO	Market operator and production operator relation
MTR	Mid-Term Report
NAP	New Protected Area
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
NF	Non-Forest
NFMS	National Forest Monitoring System
ONE	National Environmental Office
ORSTOM	Office for Scientific and Technical Research Overseas
PADAP	Sustainable Agriculture through a Landscape Approach
PAPC	Priority Areas for Plant Conservation
PCD	Plan Communal de Développement
PCI-REDD+	REDD+ Specific Principles, Criteria and Indicators
PEDD	Environmental Plan for Sustainable Development
PERR-FH	Eco-Regional REDD + - Madagascar Wetlands Project
PF	Primary Forest
PFN REDD+	National REDD+ Platform
PFR REDD+	Regional REDD+ Platforms
PGE	Overall State Policy
PLI	Inter-commune Platform
PND	National Development Plan
PNLCC	National Policy for the Fight against Climate Change
POLFOR	Forest Policy
PREE	Environmental Commitment Program
PRPF	Population Resettlement Policy Framework
RPF	National Strategy for Forest Landscapes Restoration
SAC	Municipal planning scheme
SAPM	Madagascar Protected Areas System
SAVA	SAmbava-Vohemar-Antalaha
SC REDD+	Civil Society Organization for REDD+
SESA	Strategic Environmental and Social Assessment
SIS	Safeguards Information Systems
SLCs	Local Consultative Structures
SNABE	National Fuel Wood Supply Strategy
SNRPF	National Strategy for the Restoration of Forest Landscapes
SOC	Soil Organic Carbon
SRAT	Regional spatial planning scheme

STD	Deconcentrated technical service
TGRN	Transfer of Natural Resource Management
TSS	Technical Support Staff
UN REDD+	The United Nations Program on Reducing Emissions from Deforestation and Forest Degradation
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USFS	United States Forest Service
VCUs	Voluntary Carbon Units
VNA	Committee on Forestry
VOI	Grassroot communities
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund
ZOC	Zone of controlled occupation
ZUC	Area of controlled use
ZUD	Area of sustainable use

DEFINITION OF MALAGASY WORDS USED IN THE DOCUMENT

Dina: Local social convention used to establish common rules for social cohesion, mutual support and security, and that includes sanctions when non-respect. It is elaborated during the establishment of management agreement under the GELOSE law, at village scale.

Dinabe: Social convention equal to DINA but at communal or regional scale

Fokonolona: indicate all citizens living on a specific territory

Fokontany: administrative subdivision of a commune including several villages and created with decree n°97-1257 of October 30th 1997.

KASTI: Kaomitin'ny Ala sy ny Tontolo Iainana: volunteers elected by the village to help the forest cantonment in its general functions

Koloala: Sustainable forest management or exploitation site with a quite extensive area (from 5000 to 10 000ha). They are managed by legal persons, whether private or public, with a formal delegation from the State for a rational and sustainable exploitation.

Olobe: Traditional authorities or old elder of the village

Tangalamena: traditional authorities taking care of cultural or cultural aspects

Tranobe: Dominant and important family within a community

VNA: Vaomieran'ny Ala, volunteering local structure that work with the Forest Cantonment Chief in order to ensure control over forest

VOI: Vondron'olona itotony (or COBA in French): group of volunteers to which natural resources management has been transferred through the law N°96-025 (GELOSE)

EXECUTIVE SUMMARY

AMBITION AND STRATEGIC RATIONALE FOR THE ER PROGRAM (ER-P)

“Madagascar is one of eight “hottest” biodiversity hotspots in the world based on richness and endemism of plants and vertebrates. According to the International Union for Conservation of Nature (IUCN) Global Red List data, **Madagascar is currently considered as a priority conservation area**, with a disconcerting number of species threatened with extinction (e.g. 88.5% of lemur species). Despite major biodiversity conservation efforts, some ecosystems of the eastern forest are so fragmented and degraded that many native large animal species have been lost, and the remainder are facing critical threats, among which deforestation and forest degradation are paramount, decreasing their capacity to maintain viable populations in the coming years.

At the same time Madagascar remains among the poorest countries in the world, and has shown little improvement in indicators of the well being of its population over recent years¹. The development agenda of the country faces an array of challenges in reducing poverty, including (for the eastern region) severe climatic events like cyclones, agriculture infrastructure and education² deficits, tenuous access to markets and global rise in food prices, and other environmental and social challenges exacerbated by the process of forest and biodiversity loss (less effectiveness of environmental services for agriculture activities). As a result, 70 percent of the people of Madagascar were living in poverty in 2012 and had not seen any significant improvement in their welfare during the last decades. Exacerbated by population growth this widespread poverty is increasing the pressure on forests. In Madagascar, the stakes are high: REDD+ has both the challenge and opportunity to intervene for the survival of Madagascar’s unparalleled biodiversity and forest resources, and to offer to communities an alternative to the doomed cycle of environmental degradation and diminishing agricultural returns.

Madagascar’s ER-P seeks to intervene at this nexus of poverty and environmental degradation. The central objective of this ER-P is thus not only to reduce deforestation but also to contribute to the economic development of populations and provide a solid model of sustainable and reproducible development in other regions of Madagascar. To do so, activities of the program will mainly concern the sectors of agriculture and livestock, but also energy supply as well as the forestry sector, with the clear support and engagement of local populations (including women and civil society) and local government entities, NGOs, private businesses, research organizations, etc.

¹ 2016, *Shifting Fortunes and Enduring Poverty in Madagascar: Recent Findings*, World Bank

² Razafindravononona, J., Stifel, D., Paternostro, S., *Evolution de la Pauvreté à Madagascar : 1993-1999*, INSTAT, 2001

One of the defining building blocks of the ER-P is the geographical dimension of watersheds, making a clear link between reducing poverty and forest conservation. The mountainous topography of the Eastern part of the country results in a dynamic where forests are mostly found upstream, and agriculture lands downstream. Agriculture is the primary occupation of households and the main opportunity for development, while simultaneously being the main driver of deforestation. The watershed approach provides coherence and sustainability between agriculture and forestry activities within a landscape. The ER-P seeks to combine the protection of forest cover and its biodiversity, with development through improved and sustainable agriculture, as well as energy supply (mainly wood charcoal).

The ER-P area covers a total of 6,235,200 ha of the Malagasy territory (10 percent of the national territory), including: 1,173,928 ha of intact primary forests (PF) representing 19 percent of the total area, and 1,132,613 ha of degraded or modified natural forests (MNF), representing 18 percent of the total area.

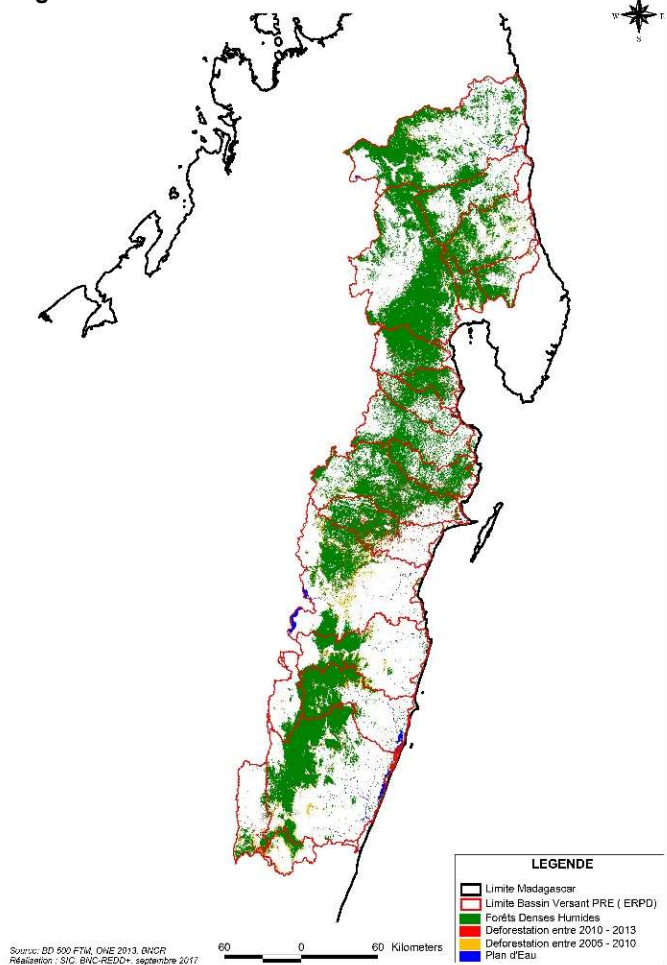
The ER-P area has been designed to address a significant part of future forest related emissions and removals, according to the following principles:

- High potential for REDD+: High forest cover and carbon stock, deforestation hotspots, higher capacity for carbon stock enhancement.
- Coherent geographical dimension for reducing poverty and forest conservation: A continuum of 40 watersheds, with potential for cost-effective interventions (linking forest conservation and development activities), respecting administrative boundaries: based on the commune's delineations.
- Presence of critical criteria for the 5-year ERPA efficiency: Presence of land-tenure management offices within communes, existing sub-projects and interventions linked to reducing deforestation:

DRIVERS AND UNDERLYING CAUSES OF DEFORESTATION AND FOREST DEGRADATION

The main direct drivers of deforestation and forest degradation in the program area are expansive agriculture (primarily *tavy*), energy production, mining (artisanal and illegal mining), forest harvesting, and livestock. The underlying drivers are population growth and demographic pressures, poverty and a reliance on economic activities that foster deforestation and forest degradation, a reliance on traditional agriculture systems and lack of adoption of new technologies, weak natural resource management and governance, incoherent policies and institutions and uncertain land tenure.

Figure 1 Watersheds and deforestation in ER-P Area



Intervention Strategy and Program Activities

Considering the wide range of drivers and agents of deforestation occurring in the area, the ER Program aims to be flexible and ensure that selected activities address the pressures that forests are subject to, in a specific and effective way. In line with national development plans, this approach for the ER-P includes a portfolio of development opportunities to stakeholders (government, donors, private sector, NGO, etc.) throughout the ER-P implementation zone. The National REDD+ Strategy and the activities in the ER-P are organized as interventions with direct and indirect impacts in terms of reduction of deforestation and forest degradation.

Implementation within the ER-P intervention area will follow a landscape approach aiming to address the direct and indirect causes of deforestation and degradation within primary watersheds (of significant size: >100,000Ha to meet the definition of a "landscape") representative of entire landscapes, as delineated by primary ridgelines, and allowing for assessing situations along value chains (or the transition to another ecozone, where applicable). This landscape-based approach is critical for clearly establishing the link between stakeholders located upstream and downstream within a landscape and clarifying causal relations within the targeted area.

The ER-P is designed with institutional arrangements that reflect the scale of deforestation and degradation, and give flexibility to communities and regions to select the most appropriate actions for their particular area. It will enable:

- Improved governance and decision-making through the development of activity and investment plans that match regional and local specificities and whose political validation will be decided by stakeholders from all levels;
- Improved land planning and use at commune level, through the development and implementation of land use plans at the commune and regional levels (SAC and SAR respectively);
- Provision of incentive for communities and the private sector to support sustainable development and improve management of agricultural and raw materials (coal, perennial and annual crops, etc.
- Improved management of land and land use-related conflicts through community and participatory mapping of activities during activity planning.

The ER-P is designed to evolve and expand over time. It will take more than the first few years to achieve deforestation reduction across the large area included in the ERP. The direct and rapid impact activities currently planned through initial investments cover only part of the considered zone and achieve tangible results in terms of emission reductions. However, the ER-P will balance the two types of activities to ensure short- and long-term profitability that allow not only the maintenance of activities, but also reinvestment in new activities and new zones. This sets forth a vision and growth path beyond the ERPA with the Carbon Fund.

Activities within the ER Program

Although the strategic options proposed in the evolving National REDD+ Strategy are not sector-specific, the ER-P, with its focus on implementation at jurisdictional scales, groups activities per sector.

Category of activity	With direct impacts	With indirect impacts
Agricultural sector	<p>AD 1 - Optimize production systems and agricultural and livestock-dedicated infrastructures</p> <p>AD 2 - Improve the management of cash crop production under the agroforestry system and improve the food security of local communities' riparian to forests</p>	<p>AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at the local level</p>
Forest sector	<p>FD 1 - Improve the management of forest areas under the landscape approach</p> <p>FD 2 - Promote private and community reforestation, rehabilitate degraded forest areas, and reforest in consideration of local needs, without converting natural forests</p>	<p>FI 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire management</p> <p>FI 2 - Improve the contribution of the forest sector to economic development by promoting the use of non-wood products and other subsectors that do not affect the carbon stock</p>
Energy sector	<p>ED 1 - Promote improved fuel wood transformation and use techniques, as well as the dissemination of improved coal stoves in urban centers</p> <p>ED 2 - Develop the use of renewable energy (solar, biogas, etc.) for domestic use</p>	<p>EI 1 - Support the harmonization and development of the legal framework relating to the development of alternatives to fuel wood and sustainable fuel wood supply</p>
Crosscutting and other sectors	<p>ID 1 - Enhance the benefits delivered by the conservation of biodiversity and ecosystem services</p>	<p>II 1 - Reinforce land security, including with reforestation actors</p> <p>II 2 - Improve the coordination and monitoring of mining and agricultural developments and ensure the setting up of compensatory reforestation</p> <p>II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level</p> <p>II 4 - Align the legal framework with the institutional one conducive to the good governance of the REDD+ mechanism</p>

Reference Emission Level (REL)

Madagascar has made an effort to increase comprehensiveness in its carbon accounting so as to ensure a reduction in risk in the internal leakage amongst activities and to ensure that all the GHG benefits generated across the landscape are fully captured. As a result, the carbon accounting framework includes the three REDD+ activities defined by Madagascar (deforestation, forest degradation and enhancement of carbon stocks - afforestation/reforestation), it includes all carbon pools and gases in deforestation, and it includes the most significant pools and gases in forest degradation and enhancement (i.e. aboveground and belowground biomass). This represents 98% of total absolute forest related GHG emissions/removals according to the Key Category Analysis.

The reference level is calculated based on average annual emissions for the period 2005-2015, using the recommendations of the GFOI Methods and Guidance Document (MGD) guidance^[2] and 2006 IPCC Guidelines. Activity data was estimated through stratified sampling following the best practices indicated by the GFOI MGD and Olofsson et al. (2014). The emission and removal factors were primarily based on terrestrial inventories conducted in 2014 in primary forests and 2016 in disturbed forests, secondary forests and agroforestry systems.

<i>ERPA term year t</i>	emissions from deforestation (tCO ₂ /yr)	emissions from degradation (tCO ₂ /yr)	removals from enhancement of carbon stocks (tCO ₂ /yr)	Total Reference Level (tCO ₂ /yr)
1	14,003,917	1,872,050	-61,739	15,814,229
2	14,003,917	1,872,050	-134,389	15,741,578
3	14,003,917	1,872,050	-207,040	15,668,928
4	14,003,917	1,872,050	-279,690	15,596,277
5	14,003,917	1,872,050	-352,341	15,523,627

Potential Emission Reductions

The Emission Reduction Potential of the ER Program based on the intervention strategy and funding level presented in the financing plan and considered set-aside of ERs to address reversal (18%) and uncertainty (4%) is estimated at **13 929 519 tons of CO₂ eq.**

Benefit Sharing

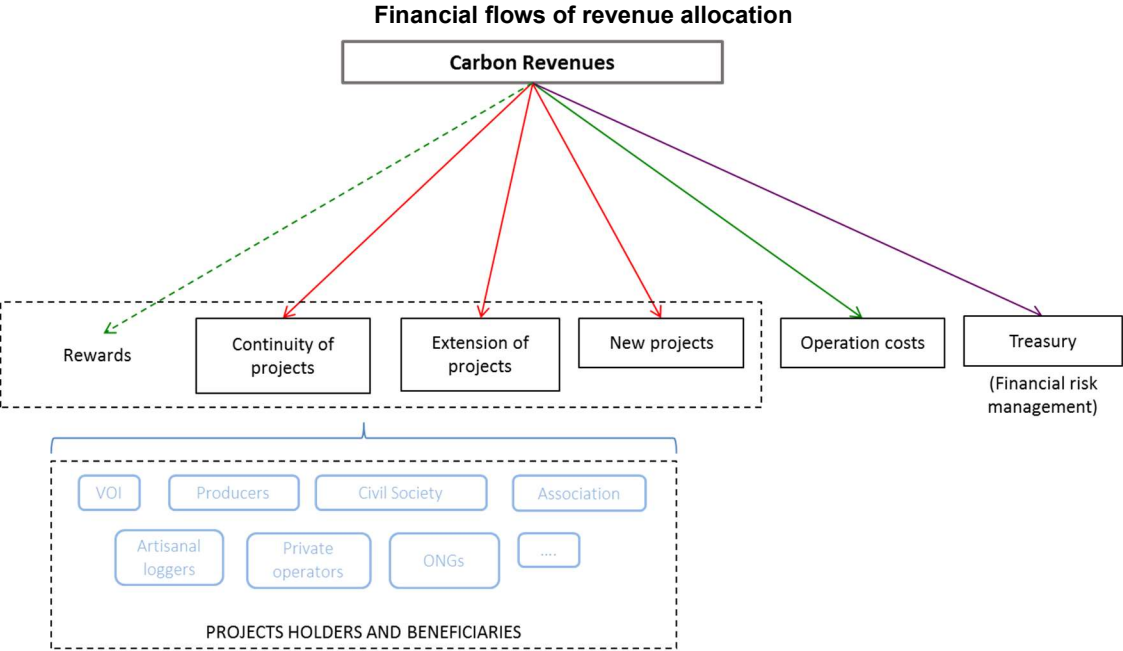
In comparison with different REDD+ contexts and countries where single value chains (within agricultural or forestry sectors) or operators are responsible for an important part of deforestation, in Madagascar and even more in the Eastern Humid Forest, agents and drivers of deforestation are highly diverse. They are generally characterized as having a relatively small-scale impact individually, but spread almost everywhere. There are almost no large-scale operators exploiting natural resources with major land holdings from which the ER-P could encourage investments and easily modify practices.

^[2] Chapter 5 of the GFOI MGD Version 2.0

Available and up-front funding cannot cover the initial overall area of the program, thus making, at each phase of carbon revenue generation, investment into new activities a priority for its continuity. Madagascar will use carbon revenues to invest in new activities and expand to cover the full area of the ER-P as well seek additional up-front investment from other sources (private sector, other international agencies or donors).

The ER-P is designed to be collaborative with the delegated entities in charge of Protected Area management (MNP, WCS, CI, and to a lesser extent MBG) on behalf of the government and people of Madagascar that have the responsibilities to ensure financial perpetuation of PAs and their community management system in the ER-P Area. The ER-P aims to ensure their continued protection into the future by including them in its priority conservation planning, and to leverage their success in reducing forest emissions as an engine of revenue generation to finance the early years of the jurisdictional program.

After each sale of ERs, carbon revenue utilization will prioritize the development and continuity of the program and current projects in the jurisdiction. The main flows of revenue allocation are: Program operation costs; Treasury; Continuity of existing projects (or part of their activities); Geographical or thematic extension of existing projects; New projects; Rewards, dedicated to social and development investment. This allocation will be contractually linked to each project.



The benefits and distribution of benefits will be based on the principles of: effectiveness, efficiency, equity, performance and non-performance criteria, and prioritization of carbon revenue at the national and regional level. Both the national and regional level REDD+ platforms will be responsible for allocating carbon revenues among the following categories:

- Continuity of existing projects (or part of their activity) that have proven their performance and are lacking funding for their sustainable operation;

- Extension of projects that have proven their performance and still have necessary funding for their perpetuation, but that could be extended to a larger area or additional activity types to increase their performances;
- Investment into new projects in the jurisdiction based on an analysis of high-priority landscape or communes.

In order to accelerate project implementation once carbon revenues are received at central level, the planning of projects will be done in two-\ phases: the first, will consist in planning according to ex-ante estimation of ERs to be generated during the current phase and corresponding carbon revenues that will be available for the next cycle— a two-year period corresponding to the time between ER verifications and; second, consisting of an identification of new projects or expansion of existing projects to be implemented according to available carbon revenues.

Implementation and Monitoring Arrangements

The institutional arrangements for the ER Program are designed based on the ongoing REDD+ readiness process and alignment with the national and sub-national (regional) level institutions and agencies.

NATIONAL

The Government of Madagascar will be the signatory of the ERPA and will be represented by the Ministry of Finance and MEEF as the Legal Entities for the Emissions Reduction Program. In this capacity, the MEEF authorizes the BNC REDD+ to administer and manage the Emissions Reduction Program. The overall responsibility for the development of REDD+ in the country rests with the BNC REDD+, on behalf of the MEEF, as the entity implementing the ER-P from an operational point of view, but also as the entity liable to the Carbon Fund.

A **REDD+ Steering Committee (COPIL REDD+)** will be the political and strategic decision-maker for the REDD+ mechanism in Madagascar, as well as for legal, operational and financial implications of the ER-P.

The **National REDD+ Platform (PFN REDD+)**, chaired by the General Secretary of the MEEF, for which the secretariat is provided by BNC REDD+, is the most important and central body of the REDD+ mechanism, as it is in charge of developing and formulating specific proposals.

An **independent observer on** safeguards will be delegated to carry out an independent audit related to safeguards processes.

REGIONAL

The **Regional REDD+ Platforms** chaired by the Head of Region, performs the same functions as the National REDD+ Platform, but at the level of each region The **Regional REDD+ Coordination Office (BRC REDD+)** will be hosted by the DREEF and will ensure secretariat and operational support to the implementation of the ER Program.

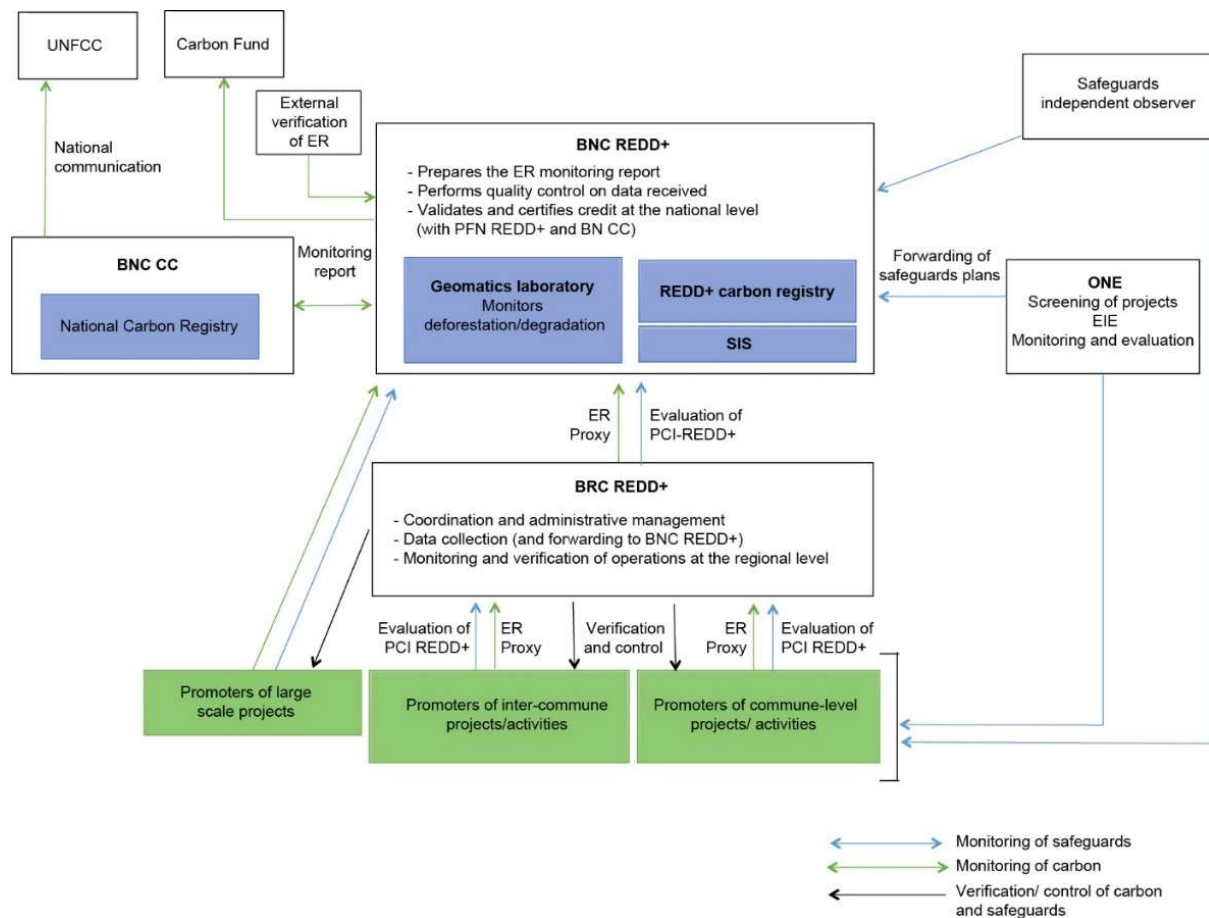
COMMUNE AND INTER-COMMUNE

Commune-level **Local Consultative Structures (SLCs)** that are close to each other and that belong to a same landscape or watershed may come together to form an **Inter-Commune Platform (PLI)**. According to the scale of intervention, SLCs or PLI will collect and prioritize REDD+ activities proposed by relevant local actors. The **Municipal Council** will validate the proposals of the SLC, and will incorporate these into the Commune Development Plan and the **Mayor** (and his/her **Executive Committee- ECM**) will oversee the activities to be carried out.

Members of Civil Society including women’s groups are included in the regional and national REDD+ platforms and are also being specifically provided with means to collect feedback among different local stakeholders to be reflected in activities and decision-making process. There are no Indigenous Peoples’ in the ER Program area.

Monitoring and Evaluation will be conducted at the level of each region by the respective regional REDD+ Coordination Offices and aggregated at the national level by the BNC REDD+. Activity reports will follow the same process as for the preparation of the activity plans, but will include the monitoring of Emission Reductions (proxies) as the basis for performance based payments. The objective in doing so is to simplify coordination and avoid multiplying interlocutors at each level.

The following diagram summarizes the monitoring and evaluation processes, without detailing them exhaustively.



Social and Environmental Risks management

A Strategic Environmental and Social Assessment (SESA) for the national REDD+ Strategy in Madagascar was conducted in a participatory manner with a broad cross section of stakeholders, including civil society, taking an active part. The assessment was conducted in support of the development of the National REDD+ Strategy and the ER Program. Through the participatory work, it was possible to refine the strategic options as well as the activities of the National REDD+ Strategy and these will be finalized in the coming months of 2017. Some associated environmental and social risks have been identified and recommendations have been made and have been taken into account in the design of the strategy. The SESA allowed for developing recommendations and safeguards actions for the strategic options and operational tools for the implementation of REDD+ projects and activities were produced based on these:

An Environmental and Social Management Framework (ESMF), a Population Resettlement Policy Framework (PRPF) and a Process Framework (PF). These three frameworks are being finalized and validated at the national level. It should be noted that under PADAP, a pest and pesticide management framework was developed and will be implemented within the ER-P, and that the ER-P's ESMF also includes elements on the management of pests and pesticides, consistent with the framework developed for PADAP.

In addition, the Working Group on Safeguards (GTS) and the BNC REDD+ have defined a set of Principles, Criteria and Indicators (PCI-REDD+) applicable in the context of Madagascar that sets a high level of social and environmental performance for the REDD+ strategy in accordance with the Cancun Safeguards, the UN-REDD Principles and the REDD+ SES principle-criteria.³ The Safeguards Information System (SIS) that will be set up to monitor the implementation of Madagascar's REDD+ strategy and the projects of the ER-P will be based on these PCI-REDD+ (see Annex III for more details). At the bottom line, the corresponding 7 principles, 32 criteria and indicators address the issues of participation, governance and transparency, but also the increase and sharing of social and economic benefits, gender mainstreaming, respect for and promotion of rights and remedies. Madagascar will work in the coming months to (i) strengthen the capacities of ER-P stakeholders, including civil society (CSOs) to monitor safeguards, and (ii) test these indicators in the field.

The management of the program's social and environmental safeguards is fully integrated into the process of identification, design and monitoring and evaluation of the ER-P's REDD+ sub-projects and activities. Any project financed by the program must therefore comply with the above-mentioned requirements applicable to them at each stage of their implementation.

To manage potential complaints and conflicts a Feedback, Grievance and Redress Mechanism (FGRM) is currently being designed and will be the responsibility of the Program Management Unit and the implementing agencies.

³ REDD+ SES (2012). *Social and Environmental Standards REDD+*, 10 September 2012, 30 pages.

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 Finance and Budget (MFB)
Type and description of organization	The MFB is in charge of ensuring the right application of financial, fiscal and and budget national policies in Madagascar. It ensures the management and monitoring of external support and contribute to the harmonization of cooperation with donors, ensure the supervision of financial and public institutions.
Main contact person	Mr RAJAOBELINA Falihery
Title	General Secretary of MFB
Address	Porte 314 -3ème étage, Immeuble du Ministère des Finances et du Budget -Antaninarenina -Antananarivo 101
Telephone	+261 20 22 336 30
Email	mfb-sg@moov.mg
Website	www.mefb.gov.mg

Name of the co-signatory entity	Ministry of Environment, Ecology and Forest (MEEF)
Type and description of organization	The MEEF is in charge of the management of environmental resources and services. The Ministry has been in charge of the REDD+ process since 2008. It ensures the coordination of REDD+ related activities through the REDD+ National Coordination Office (Bureau National de Coordination REDD+ - BNC REDD+).
Main contact person	Mr Liva Hariniaiana Ramiandrarivo
Title	General Secretary of MEEF
Address	B.P 3948, Rue Toto RADOLA – Antsahavola, Antananarivo 101
Telephone	
Email	liva.ramiandrarivo@meeft.gov.mg
Website	www.ecologie.gov.mg

1.2. ORGANIZATION(S) RESPONSIBLE FOR MANAGING THE PROPOSED ER PROGRAM

Same entity as ER Program Entity identified in 1.1 above?	Yes, but through the BNC REDD+
Name of organization	National REDD+ Coordination Office – BNC REDD+
Type and description of organization	BNC REDD+ will be responsible for coordinating the implementation of the different activities on the ground and part of the management of the performance-based payment system. It is the secretary of the National REDD+ Platform, which is responsible for the elaboration of all strategic orientations at national level but also for the ER-P. These orientations have then to be officially approved by the National REDD+ committee.
Organizational or contractual relation between the organization and the ER Program Entity identified in 1.1 above	The BNC REDD+, through the decree N°8090/2014 is already officially in charge of the coordination of all REDD+ related activities.
Main contact person	Mamitiana Andriamanjato
Title	Coordinator of BNC REDD+
Address	Lot II A 105 0, Iadiambola Nanisana, Antananarivo (101)
Telephone	Tel: +261 34 05 902 11
Email	coordonateur.bncredd@gmail.com / ngamamitiana1010@yahoo.fr
Website	Upcoming (June 2017)

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 GOVERNMENTAL ENTITIES		
National REDD+ COFIL	To be defined	National steering committee of the REDD+ process
National REDD+ Platform	Mr Liva Ramiandrarivo liva.ramiandrarivo@meeft.gov.mg	General Secretary of MEEF President of the National REDD+ Platform
Ministry of Environment, Ecology and Forest (MEEF)	Rafidison Manassé rafidi.manase@gmail.com 034 05 626 38 Zafitsara Elisette	Environmental managers, Represent the MEEF in the National REDD+ Platform

	Tel : +261 34 09 437 23 zafette63@yahoo.fr	
Ministry of Agriculture, Livestock and Fisheries (MAEP)	Rasolofoarivony Mamy Tel : +261 3439 416 66 rasolofoarivonymamy85@gmail.com Rafalimanana Oliva oliva_rafali@yahoo.fr	Environmental Manager, Represents the MAEP in the National REDD+ Platform Coordinates the PADAP Program
Ministry of Fisheries (MP)	Rafidison Roginah Tel : +261 34 05 579 61 rogirafidi@yahoo.fr	General Director of partnership and sustainable development Represents the MP in the National REDD+ Platform
Ministry of Water	Randrema Miora Harinavalona Tel : +261 3204 680 62 / 3302 722 13 miorarandrema@gmail.com celluleenvironnementale@mineau.gov.mg	Environmental Manager, Represents the Ministry of Water in the National REDD+ Platform
Ministry of Interior and Decentralization	Razafimandimby Paul Joseph pauljosepha@gmail.com Tel : +261 34 05 528 81	Chief of Projects and Studies department Represents the Ministry of Interior and Decentralization in the National REDD+ Platform
Ministry of Territory Management and Equipment	Rasoloharivony Farahanta Rivonarisoa Tel : +261 34 05 548 51 farahanta30@yahoo.fr	Chief of Environmental Department Represents the Ministry of Territory Management and Equipment in the National REDD+ Platform
Ministry of Mines and Oil	Razafindralambo Andriatsilavina Balita Tel : +261 32 03 110 10 balita@live.fr	Manager of Studies at Environmental and Security Regulation Direction Represents the Ministry of Mines in the National REDD+ Platform
Ministry of Justice	Rakotonindrina Onjamalala Tel : +261 33 28 444 22 minjus.de@gmail.com	Magistrate Collaborator at Studies Direction Represents the Ministry of Justice in the National REDD+ Platform
Ministry of Public Security	RandriamandersY André Tel : +261 34 14 005 18 Andrewsdelsarto75@yahoo.fr	Director of Organization and employment at National Gendarmerie Represents the Ministry of Public Security in the National REDD+ Platform
REGIONAL ENTITY		
Regional REDD+ Platform of Analanjirifo	Malo Benoit	Chief of region and president of the Regional REDD+ Platform
Regional REDD+ Platform of Atsinanana	Talata Michel	Chief of region and president of the Regional REDD+ Platform
Regional REDD+ Platform of Sava	Velomaro Faustin	Chief of region and president of the Regional REDD+ Platform

Regional REDD+ Platform of Alaotra Mangoro	Ranaivonirina Jean Yves	Chief of region and president of the Regional REDD+ Platform
Regional REDD+ Platform of Sofia	Zaranaina Tohanaina Ernest region_sofia@yahoo.fr Tel : +261 32 43 367 40	Chief of region and president of the Regional REDD+ Platform
ORGANISM IN CHARGE OF ENVIRONMENTAL POLICY APPLICATION		
Madagascar National Parks (MNP)	Ramangason Guy Suzon, dg@madagascar.national.parks.mg , tel: +261 32 05 047 17	Chief Executive Responsible for coordination of all activities in MNP Protected Areas and member of the National REDD+ Platform
National Environmental Office (ONE)	Rakotoary Jean Chrisostome, icrakoto@pnae.mg ,	Chief Executive of ONE, responsible for safeguards screening and evaluation of projects under the program
National Coordination Office for Climate Change (BNC CC)	Ramaroson Nivohary, nivoohary@yahoo.fr , Tel : +261 34 434 20 90	Director of BNC CC and responsible for the National Greenhouse Gas Inventory and National Carbon Registry
National Coordination Office for REDD+ (BNC REDD+)	Mamitiana Andriamanjato Tel : +261 34 05 902 11 coordonateur.bncredd@gmail.com tel: +261 34 05 902 11	Principal coordinator of all REDD+ activities and of REDD+ process and implementation of the ER-P Representative of the secretariat of the National REDD+ Platform
ORGANISATIONS NON GOUVERNEMENTALES ET DE LA SOCIÉTÉ CIVILE		
Civil Society Organization for REDD+ (SC REDD+)	Daniel Rabeson Tel : +261 34 20 555 53	President of Civil Society Organization (CSO REDD+)
	Raonintsoa Paul (Alliance Voahary Gasy) raonintsoa@yahoo.fr Tel : +261 34 01 113 41	Chief of Commission Protected Areas and Forest, Member of the National REDD+ Platform,
	Raparison Eric (Sehatra Iombonana ho an'ny Fananantany -SIF) reh212001@yahoo.fr Tel : +261 34 16 534 63	National Coordinator of the SIF organization, Member of the National REDD+ Platform,
Wildlife Conservation Society (WCS)	Clausen Alison Tel : +261 32 85 983 16 aclausen@wcs.org	Makira REDD+ Project holder approved by VCS Member of the National REDD+ Platform
WWF - MDG	Rakotondrasoa Laza Tel : +261 34 22 100 01 lrakotondrasoa@wwf.mg	Responsible for the PHCF project in the CAPAM area

		Member of the National REDD+ Platform
Conservation International - MDG	Randrianarisoa Jeannicq jrandrianarisoa@conservation.org	CAZ REDD+ Project holder approved by VCS Member of the National REDD+ Platform
PRIVATE SECTOR		
Fanalamanga Society	Rakotonirina Augustin, aug.rakoto@gmail.com , Tel: +261 32 05 361 37 Rakotondrainibe Charles Tel : +261 32 07 244 88 charl_rainibe@yahoo.fr	Chief executive of Fanalamanga, main timber providers in Madagascar, Technical Director of Fanalamanga and representative of private sector in the National REDD+ Platform
National Federation of Loggers	Razafintsalama Claudie Tel : +261 34 13 715 2 gnefm@moov.mg irenerazafy@gmail.com	National Coordinator of the Federation and representative of loggers in the National REDD+ Platform
FUNDING PARTNERS		
Forest Carbon Partnership Facility	Tracy Lee Johns, tjohns@worldbank.org ,	Technical and financial support for the finalization of REDD+ readiness and for the design of the ER Program including preparation of the ERPD.
World Bank	Benjamin Garnaud bgarnaud@worldbank.org	Technical and Financial support for the REDD+ Readiness and for the design of the ER Program and for the PADAP as well
Délégation de l'Union Européenne à Madagascar	Andrianirina Nicole Tel : + 261 20 22 242 16 nicole.andrianirina@eeas.europa.eu	Environmental and Rural Development Program Manager Potential technical and financial support for the implementation of the ER-P.
Agence Française de Développement (AFD)	Claire-Isabelle Rousseau rousseauuci@afd.fr Danielle RABENIRINA rabenirinad@afd.fr	Financial support for the PADAP program
GIZ	Rust Jenny jenny.rust@giz.de Tel: +261 32 05 425 36 Burren Christian christian.burren@giz.de Tel: +261 33 02 882 69	Technical Advisors at GIZ and responsible of the PAGE GIZ (Programme d'Appui à la Gestion de l'Environnement) supporting the REDD+ process and ER-P development on several aspects
UN REDD+	Boccucci Mario (UN-REDD / Geneva) Tel: +41 (0) 22 917 8944	Technical and financial support for REDD+ readiness including support for the national MRV system and the National REDD+ Fund

USAID	Razafimahatratra Tiana Tel : +261-34-07-428 26	Financial support for MRV and NFMS development
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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

Madagascar finalized its Readiness-Package while concurrently developing the ER-P. It has capitalized on the readiness process to align with and inform the ER-P, especially with regards to the specific activities, targeted areas, accounting frameworks, and populations herein. During the readiness process, government entities and stakeholders have focused on the practical elements of REDD+ implementation as it could occur in the ER-P. Overall, national preparation for REDD+ has included best-practice analyses, public dialogue and information sharing and discussion among ministries on conceptual principles, mechanisms and methodologies, as well as the practical application of these elements within the proposed framework of the ER-P. This concurrent process has enabled Madagascar's many actors to quickly grasp the concepts and processes of implementing REDD+ at the scale described within the ER-P. Further, both the Readiness and ER-P preparation efforts build on experience already gained through the implementation of multiple REDD+ projects.

An evaluation of Madagascar's progress in achieving different facets of REDD+ readiness –as laid out in the Framework of Evaluation of the Preparation of the FCPF – was conducted in June 2017 and submitted to the FCPF Participants Committee (PC) as part of Madagascar's Readiness Package, and was submitted to the FCPF in August 2017.

This review of the REDD+ process in Madagascar was conducted in a participatory, inclusive and transparent way, mobilizing stakeholders and key groups (such as NGOs, civil society, private sector, development partners, government agencies, etc.) both at national and regional level. Stakeholder consultations assessed each of the 34 criteria of the FCPF's REDD+ Readiness Assessment Framework and thus assessed progress at the national level.

Although the review is essentially related to the readiness phase, at the same time the recommendations affect both the readiness phase and the implementation phase. The output of the consultations comprises a list of the elements to be improved and the prioritization of follow-up actions to achieve a level of preparation satisfactory to all the stakeholders. It should also be noted that while the Readiness Package has been submitted, activities continue to strengthen institutions, build capacity, consult and enhance participation of key stakeholders including local communities to more effectively prepare for REDD+ implementation.

Table 1 provides the program of consultations during this evaluation process:

Level	Location	Date	Typology of Participants	Men	Women	Total
National	Antananarivo	May 9	CSO, VOI	7	8	15
National	Antananarivo	May 10	Technical and financial partners (TFP), private sector, technical groups (safeguards and methodology)	7	9	16
National	Antananarivo	May 11	Ministries, Regions, Prefectures	7	9	16
Regional - Analanjirofo	Fénérive Est	May 16	CSO, VOI	17	1	18
Regional - Analanjirofo	Fénérive Est	May 17	REDD+ Regional Platform	17	2	19
Regional - Atsinanana	Toamasina	May 16	CSO, VOI	19	11	30
Regional - Atsinanana	Toamasina	May 17	REDD+ Regional Platform	12	7	19
Regional - Sofia	Atsohihy	May 23	CSO, VOI	17	7	24
Regional - Sofia	Atsohihy	May 24	REDD+ Regional Platform	15	5	20
Regional - Alaotra Mangoro	Moramanga	May 23	CSO, VOI	16	5	21
Regional - Alaotra Mangoro	Moramanga	May 24	REDD+ Regional Platform	13	5	18
Regional - SAVA	Sambava	May 30	CSO, VOI	19	1	20
Regional - SAVA	Sambava	May 31	REDD+ Regional Platform	10	4	14
			Total people consulted	176	74	250
National	Moramanga	June 21-23	REDD+ National Platform, RRP, CSOs and regional VOIs	25	10	35

According to the representative group of stakeholders involved in the review, Madagascar has made good progress in REDD+ readiness, but effort is still needed to consolidate gains. For only two criteria of the 34, the effort required is considered more significant: (i) feedback to stakeholders (criterion 10), and (ii) development of the emissions reduction register and monitoring activities (criterion 22). It was acknowledged that Madagascar's government and REDD+ community made considerable improvements in the following areas:

- *Institutional arrangements:* The institutional framework for REDD+ is now designed from the national level to local implementation. Improvement and refinement are still needed in certain areas such as the details of facilitating processes and defining the exact distribution of roles and responsibilities between entities, but the vision for implementation is clearly defined. To date, some entities exist and are functional and actively involved in the design of REDD+, like the National REDD+ Platform and 5 Regional Platforms (of the ER-P area).
- *Development of the monitoring mechanism and the Safeguard Information System (SIS):* A SESA has been carried out and three national environment and social management frameworks related to safeguards have been prepared. The frameworks are in the process of validation through national workshops. The Safeguard Information System has been designed and is currently being and tested and refined to improve efficiency and accuracy. The SIS has been conceived in order to be accessible via the Internet, thus contributing to transparency of safeguards monitoring. Measures to facilitate access for those without access to the internet are being tested. Madagascar developed national environmental and social standards through the use of REDD+ specific Principles, Criteria and Indicators (PCI-REDD+), respecting Cancun and UNFCCC safeguards;

- *Development of National Forest Emission Reference Levels and the institutional arrangements for MRV and the NFMS:* The FREL has been reported to the UNFCCC and is currently undergoing further revision based on new data and analysis. The analysis of forest cover has allowed to identify that during the reference period deforestation has increased substantially among years, suggesting that the current Reference Level calculation methodology based on average historical deforestation would be detrimental to Madagascar by hindering the valorization (on carbon markets or in the NDC) of an important part of initial performance in reducing deforestation, thus jeopardizing the incentivizing nature (performance-based) of the REDD+ process from its beginning. MRV and NFMS systems are almost operational but still being improved in order to streamline institutions and enhance accessibility and collaboration among institutions;
- *Development of the Benefit-Sharing Mechanism:* strong stakeholder participation has already enabled the definition of the main underlying criteria of the benefit-sharing mechanism by focusing on the ER-P at this stage.
- *Stakeholder consultation, public communication and structuring the entities linked with implementation* (see also section 5): Extensive consultations have been conducted, through various studies, through the REDD+ National Platform and the REDD+ Regional Platforms, and various Technical Working Groups;
- *Development of the National REDD+ Strategy:* The National REDD+ Strategy has been drafted based on broad stakeholder consultations at all levels. The draft strategic document is being presented and consulted upon, and is expected to be formally validated, based on revisions from stakeholder feedback, in December 2017. The development of this strategy has been a process undertaken in parallel to the ER-P design, and most aspects and activities described in the ER-P are consistent with if not identical to those appearing in the current draft National Strategy. For each workshop or consultation made during the elaboration of the national strategy, the ER-P was used as a concrete basis and example of the application of such a strategy, although applied in the context of the Eastern Humid Forest. This approach ensured that all studies and consultations specific to the ER-P design were informing the National Strategy (at least for the humid eastern forest), and simultaneously ensured that the national REDD+ vision was embracing the ER-P rationale and implementation process. All elements described in this ER-PD offer a solid basis for further REDD+ implementation in other ecoregions.

During the R-Package auto-evaluation process, certain recommendations were vigorously discussed at each workshop and the national validation workshop. Steps have already been taken to prioritize action on the elements below. Among the most discussed issues are the following:

Component 1: Organization of preparation and consultation

- Operationalize the REDD+ Regional Coordination Offices (BRC REDD+) of the ER-P area as soon as possible;
- Implement the Local Consultative Structures (SLCs) (in the municipalities which do not yet have them and where REDD+ activities are planned) and strengthen the place of VOIs (forest-dependent) in the operation of this structure;
- Clarify the roles and responsibilities of all institutions, and define the roles in a guide or handbook;

- Make communications consistent (especially for the local level), and ensure the adequacy and acceleration of feedback after consultations;

Component 2: Preparation of the REDD+ strategy

- Strengthen the intersectoral approach (decision-making, coordination, land-use planning and spatialization of activities) on a priority basis, and take migration into account;
- Ensure equity within the revenue sharing mechanism and the management of carbon related revenues, through legal texts and development of specific criteria during REDD+ project planning and prioritization;
- Place particular emphasis on alternative development solutions to reduce deforestation and forest degradation.

Component 3: Reference level for emissions

- Capitalize on the many experiences in Madagascar, and realistically adapt the methodology for Reference Level calculation to the current and near future deforestation context in Madagascar in order to ensure efficiency of REDD+ mechanism;

Component 4: Forest monitoring systems and safeguard measures

- Involve stakeholders more strongly in the monitoring system;

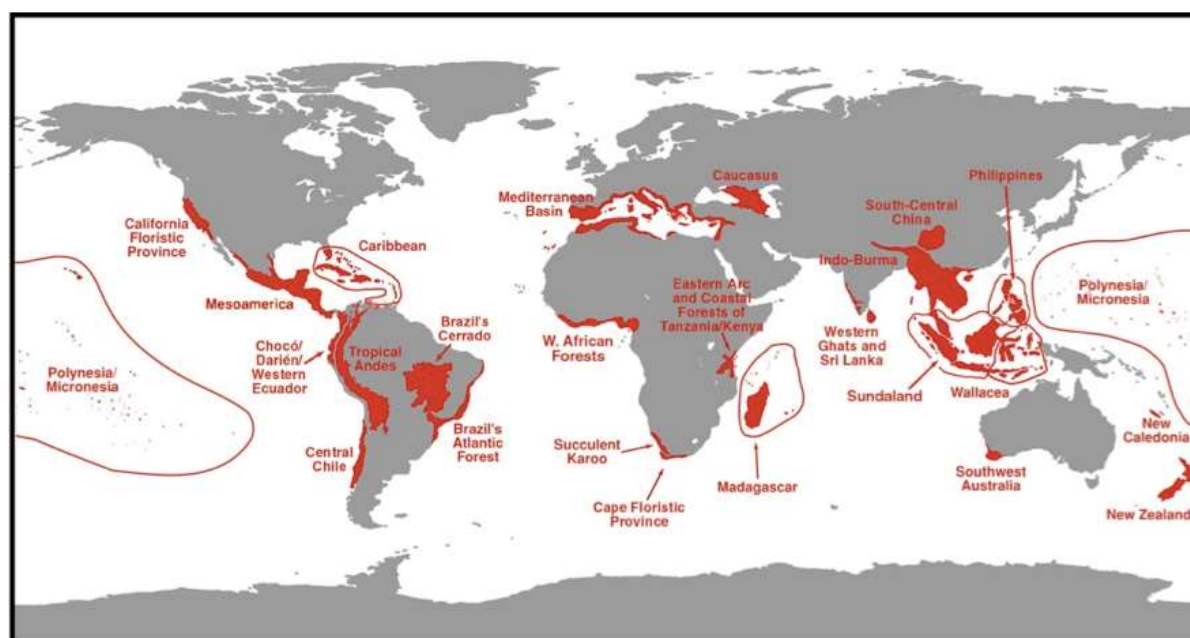
Exchanges between stakeholders and members of the BNC REDD+ team in these workshops have provided important opportunities to strengthen mutual understanding, to refine the action plan for REDD+ readiness and to promote the ownership and collaboration that are crucial to the success of REDD+ in Madagascar.

The country's Readiness Package Participatory Review process integrates a specific action plan for the next months ([available on FCPF website](#)).

Beyond FCPF-specific Readiness activities, Madagascar has experience with several relatively advanced REDD+ pilot initiatives and projects, including two in the ER-P area: the Makira forest, operated on behalf of the GOM by WCS, and CAZ forest corridor project operated on behalf of the GOM by Conservation International. Some of these projects or initiatives have been in operation since 2001 and have, as a result, provided a great deal of data and experience allowing for a fairly detailed analysis of potential REDD+ opportunities and barriers in Madagascar. This is a substantial strength of the ER-P and REDD+ overall in Madagascar.

2.2. AMBITION AND STRATEGIC RATIONALE FOR THE EMISSIONS REDUCTION PROGRAM

“Madagascar is one of eight “hottest” biodiversity hotspots in the world based on richness and endemism of plants and vertebrates⁴. According to the International Union for Conservation of Nature (IUCN) Global Red List data, Madagascar is currently considered as a priority conservation area, with a disconcerting number of species threatened with extinction (e.g. 88.5% of lemur species). Despite major biodiversity conservation efforts, some ecosystems of the eastern forest are so fragmented and degraded that many native large animal species have been lost, and the remainder are facing critical threats, among which deforestation and forest degradation are paramount, decreasing their capacity to maintain viable populations in the coming years.



The 25-world's hotspot of biodiversity⁵

At the same time Madagascar remains among the poorest countries in the world, and has shown little improvement in indicators of the well-being of its population over recent years⁶. The development agenda of the country faces an array of challenges in reducing poverty, including (for the eastern region) severe climatic events like cyclones, agriculture infrastructure and education⁷ deficits, tenuous access to markets and global rise in food prices, and other environmental and social challenges exacerbated by the process of forest and biodiversity loss (less effectiveness of environmental services for agriculture activities). As a

⁴ Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853.

⁵ Myers, N., Mittermeier, R. A., Mittermeier, C. G., Da Fonseca, G. A., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853.

⁶ 2016, *Shifting Fortunes and Enduring Poverty in Madagascar: Recent Findings*, World Bank

⁷ Razafindravononona, J., Stifel, D., Paternostro, S., *Evolution de la Pauvreté à Madagascar: 1993-1999*, INSTAT, 2001

result, 70 percent of the people of Madagascar were living in poverty in 2012 and had not seen any significant improvement in their welfare during the last decades. This is all the more true in the ER-P area as poor households live overwhelmingly in rural areas and depend mainly on agriculture for their livelihood⁸. The unsustainable and unplanned expansion of the agricultural frontier came at the expense of forests, making local people increasingly vulnerable as the environmental services ensured by forests, and on which they depend for livelihoods are threatened. The weak level of education⁹ and limited use of agricultural inputs is a major reason for low agricultural productivity in this agro-ecological region, contributing to poverty.

This ER-P seeks to intervene at this nexus of poverty and environmental degradation. The central objective of this ER-P is thus not only to reduce deforestation but also to contribute to the economic development of the populations and provide a solid model of sustainable and reproducible development in other regions of Madagascar. To do so, activities of the program will mainly concern the sectors of agriculture and livestock, but also energy supply as well as the forestry sector, with the clear support and engagement of local populations (including women and civil society) and local government entities (STD, CTD), NGOs, private businesses, research organizations, etc. The drivers and agents of deforestation and forest degradation are multiple and stem from different sectors, both directly and indirectly. But poverty is the main indirect driver and it prevents the adoption of sustainable practices, such as for agricultural productivity improvements at a household and local level because of the need for up-front financial investment. Exacerbated by population growth this widespread poverty is increasing the pressure on forests. In Madagascar, the stakes are high: REDD+ has both the challenge and opportunity to intervene for the survival of Madagascar's unparalleled biodiversity and forest resources, and to offer to communities an alternative to the doomed cycle of environmental degradation and diminishing agricultural returns.

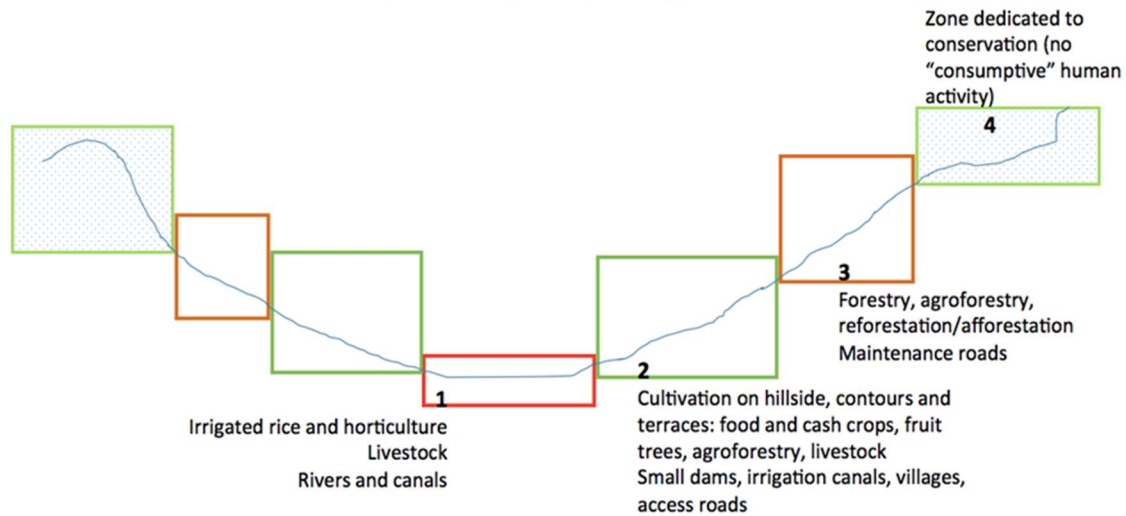
One of the defining building blocks of the ER-P is the geographical dimension of watersheds, making a clear link between reducing poverty and forest conservation. Agriculture is at the same time the primary occupation of households within the ER-P area and the main opportunity for development, while simultaneously being the main driver of deforestation. The ER-P seeks to combine the protection of forest cover and its biodiversity, with development through improved and sustainable agriculture, as well as energy supply (mainly wood charcoal).

⁸ Minten B., Zeller M., Randrianarisoa C., Factor Use and Agricultural Productivity, in Bart Minten and Manfred Zeller Eds, *Beyond Market Liberalization: Welfare, Income Generation and Environmental sustainability in Rural Madagascar*, Ashgate, 2000, pp. 79-118

⁹ Randrianarisoa, J. C., & Minten, B. (2001). Agricultural production, agricultural land and rural poverty in Madagascar.

Figure 2 - Typical landscape in Madagascar defined as the building block of the ER-P

Land use within a landscape – profile of a typical valley
 Identification of zones for an integrated landscape management approach



In the context of Madagascar forests are linked to agriculture activities through watersheds: The mountainous topography of the Eastern part of the country results in a dynamic where forests are mostly found upstream, and agriculture lands downstream. Forests ensure environmental services that are critical for agricultural productivity and livelihoods: hydrological services, regulation of the flow of water and reduction of floods and water shortages, essential services for downstream urban water users and hydroelectricity generation, reduction of soil erosion and sedimentation (which can adversely affect agricultural activities, and in particular irrigated perimeters downstream).

The watershed approach provides coherence and sustainability between agriculture and forestry activities within a landscape. It is inherently intersectoral as a strategy for improved and sustainable livelihoods that can achieve multiple objectives in terms of food security (small-scale fisheries for protein supply), water and energy supply security, biodiversity conservation, mining activities, etc. The watershed approach, by improving land-use planning within a watershed as the landscape unit, is all the more important considering that population growth, estimated at 2.8 percent per year has increased demand for agricultural land both for subsistence production and for cash crops and has consequently increased the pressure on forests. Poor soil management in areas outside of forests reinforces expansive land clearing and incursions into forest areas where the soil is more fertile.

The ER-P area covers a total of 6,235,200 ha of the Malagasy territory (10 percent of the national territory), including: 1,282,772 ha of intact primary forests (PF) representing 20,7 percent of the total area, and 929,613 ha of degraded or modified natural forests (MNF), representing 15 percent of the total area.

The ER-P area has been designed in order to address a significant part of future forest related emissions and removals, according to the following principles:

- High potential for REDD+:
 - High forest cover and carbon stock

- Deforestation hotspot
- National higher capacity for carbon stock enhancement
- Coherent geographical dimension for reducing poverty and forest conservation:
 - A continuum of 40 watersheds, with potential for cost effective interventions (linking forest conservation and development activities)
 - Respecting administrative boundaries: based on the commune's delineations.
- Presence of critical criteria for the 5-year ERPA efficiency:
 - Presence of land-tenure management offices within communes.
 - Existing sub-projects and interventions linked to reducing deforestation:

The ER-P focuses primarily on deforestation (land-use change) rather than forest degradation. While forest degradation is not ignored as a state, internal analyses conducted by BNCR (analysis of historical changes in forest cover, forest inventories and consultations) during national REDD+ readiness process and for the development of the ER-P have shown that the process of deforestation is the major contributor of forest sector emissions. The notion of classical degradation is only a short transition phase before deforestation. The vast majority of deforestation (and degradation) in the immediate ER-P area is caused by the use of natural resources by local populations, who face very high levels of poverty.

The ER-P sets as a central objective to contribute to the economic development of these populations, developing sustainable income streams that lessen pressure on the forest. The area contains abundant natural resources, and with available best practices and training, can be exploited in a sustainable way. This strategy will not only initiate a transformative development process within the ER-P area, it will also provide a development model that could be replicated in other regions of Madagascar where populations face similar economic challenges. The intervention area of the program represents a potential volume of emissions reductions that would match the capacity of up-front financing for the jurisdiction and thus credibly expand the concept in another potential emissions reduction program in Madagascar. During early design phases consultations highlighted that any REDD+ program at the national level would inherently have to include potential for scaling up and expansion through the re-investment of carbon revenues.

As discussed, the historically high rate of deforestation, the high level of threatened endemic species, and the current lack of economic and subsistence alternatives for communities engaged in forest degradation and deforestation have elevated this region as the government's clear priority for REDD+ implementation. The program contains remote areas with very little road access, and its mainly-rural population depends almost entirely on available natural resources for their subsistence and livelihoods. This combination of high threat/priority location and an innovative ecological/jurisdictional approach set the stage for transformational change at the scale necessary to save these forests of Madagascar, and subsequently scale up to other ecoregions.

During the five years of the ERPA, the program will mainly focus on activities that would directly lead to the generation of emission reductions in order to ensure the carbon performance and thus the REDD+ auto-financing process from the start and enable afterwards and in longer term process all transformational activities (improve sectoral policies, reinforcement of the national REDD+ framework including legal and institutional aspects). Thus, the main activities during the ERPA will be focused on:

- Conservation of natural forest areas;
- Rural development of communities close to forests mainly through improvement of agriculture practices and productivity;
- Promotion of sustainable sources of energy and alternatives to traditional wood charcoal production practices.

2.3. POLITICAL COMMITMENT

Numerous high-profile communications, policies, and actions demonstrate Madagascar's firm political commitment to REDD+.

Inter-ministerial action on ER-P development.

The ER-PIN was endorsed by three different Ministers, the MEEF, the Minister of Agriculture and the Minister of Energy and Hydrocarbons, under the overarching guidance and leadership of the Prime Minister of Madagascar. This inter-ministerial engagement underpinned the very design of the ER-PIN, as evidenced by the watershed approach to avoided deforestation and degradation which encompasses a set of activities touching on community livelihoods, agricultural intensification and energy access solutions, and also forest conservation on higher slopes and ridges zones of watersheds. It also demonstrates the interactive way in which the design reflects the unique challenges and circumstances of Madagascar.

Madagascar's ER-P reflects the recognition of the need for a multisector approach to REDD+ in order to be successful and the need for inter-ministerial support. The conceptualization of the ER-P was a collaborative effort among ministries through the National REDD+ Platform (12 different ministries are represented, as are regional authorities). The involvement of these ministries demonstrates the highest level of endorsement of the Program to date. As a next step, a national high-level REDD+ Committee, whose members are the General Secretaries of the concerned ministries (see description in section 6.1), will validate the approach, elevating the political commitment further. A similar committee, the Inter-Ministerial Committee for Environment (CIME – French acronym), already exists but is not really functional. One current proposition from a part of the stakeholders is to try to use this existing platform and benefit from the REDD+ process to strengthen it.

Community Forest Management

As explained before, in Madagascar the balance between natural capital and livelihoods is extremely fragile. Local, often isolated, rural populations depend on the country's natural resources to ensure basic livelihoods. Poverty in rural areas, where approximately 80 percent of the population lives, is higher (77.9 percent of the rural population) than in urban areas (35.5 percent of the urban population) and generally the further away from urban centers the more precarious the living conditions are.

The Government of Madagascar recognized that community-based forest management is a key tool to transform this fragile poverty-environment balance into a virtuous cycle of development. **In line with REDD+ principles**, Madagascar conceived it as a way to increase conservation effectiveness by devolving power and rights to local communities, a key tool for this to work is to improve local livelihoods through direct resources management. Madagascar was one of the first countries in the southern hemisphere to

put in place a legal framework for community-based natural resources management, with the GELOSE (GEstion LOcale SEcurisée) law (law 96-025) in 1996. The GELOSE promotes the transfer of management of a range of different natural resources to local communities. This was followed in 2001 by a forest-specific decree known as Gestion Contractualisée des Forêts or GCF (decree 2001-122) (see more details on section 4.4).

Protected Areas

The government's commitment to the emission reduction program is also reflected in its Protected Areas policies. Important achievements include:

- The government created 95 New Protected Areas (NPAs), that include all six categories recognized by IUCN. When added to the long-standing Protected Areas (PAs) and National Parks, Madagascar now contains a total of 123 PAs. The network of protected areas now covers 7,082,525 ha and includes around 70% of the remaining natural forests.
- The creation of the Foundation for Protected Areas and Biodiversity of Madagascar (FAPBM) is contributing to the protection of more than 2 million hectares of protected areas out of the 7,082,525 hectares of Madagascar System of Protected Areas (SAPM) by using capital and sinking funds to finance PA management but cannot cover costs of all protected areas;
- As part of efforts to improve the conservation and sustainable development of forest resources, 281 precious wood species were included in the Appendix II of CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) on March 2013 at the request of the CITES Management Authority of Madagascar (Directorate General for Forests).

The New Forest Policy

The government developed a New Forest Policy (POLFOR) in 2017 that is in the process of being adopted. BNC REDD+ has been actively involved in the development of the policy, which now formally includes REDD+:

- *Objective 3.3 of the New Forest Policy aims to “Establish innovative alternative mechanisms for sustainable financing of forest actions” and offers the following guidance on REDD. “In particular, the REDD+ mechanism must form a sustainable incentive system for emissions reductions, and deal with the many interdependent socio-economic and political factors that lead to deforestation and forest degradation. This includes: (i) encouraging development partners to support the implementation of the REDD+ with a focus on environmental and social performance and fair and equitable sharing of benefits and other advantages, and (ii) create and or strengthen entities to monitor and evaluate REDD+ activities.”*

The participation of BNC REDD+ in the development of POLFOR made it possible to also enhance efforts to reinforce carbon stocks:

- *Objective 1.3 of the New Forest Policy is to “Enhance the fight against deforestation and forest degradation”. This states that “It is essential that actions to combat deforestation and forest degradation be carried out in parallel with initiatives to increase forest areas and productivity by: (i) improving the management of sustainable exploitation (harvesting of fuel wood, logging*

permits, and operating permits) through the involvement of stakeholders in the procedure for the issuance of access, use and harvesting permits; (ii) consensual delimitation of agro-pastoral land as part of the implementation of actions for the restoration of forest landscapes; (iii) development of collective actions between the various sectors to more effectively manage bush fires, grazing fires and forest fires. In order to ensure that actions are sustained over time, it is necessary to (iv) promote environmental awareness through sustained efforts in terms of education and communication.”

Currently, BNC REDD+ is also participating in the revision of the Forestry Code, which will gather all regulatory texts linked with and necessary to the new Forest Policy, and in the coming months special attention will be paid to drafting the necessary regulatory texts for the implementation of REDD+. The revision of the Forest Code is underway and as part of the Forestry Code, these new laws will introduce a new *definition of forest that emphasizes the functional contribution in terms of environmental (and cultural) services* rather than numbers of trees¹⁰.

National Strategy for Forest Landscapes Restoration (SNRPF)

Madagascar's commitment to AFR100¹¹ for the restoration of 4 million Ha of degraded and deforested land contributes to the Bonn Challenge to restore more than 150 million hectares of land by 2020. As a result, the National Strategy for Forest Landscapes Restoration clearly refers to the role played by REDD+ as a lever for mobilizing financial resources through climate finance, especially ecologic restoration of natural forests (through the Green Climate Fund, Adaptation Fund and results-based payments for REDD+ in particular).

Nationally Determined Contribution (NDC)

In 2015, Madagascar submitted its NDC¹² to the UNFCCC Secretariat, which proposes an emission reduction contribution of at least 14 percent of national GHG, and an increase of GHG absorption of at least 32 percent (both compared to BAU). As such, the NDC highlights a crucial role for the LULUCF sector, to contribute 61 MtCO₂ of Emissions Reductions (ERs) through a variety of interventions. REDD+ is noted as one of the priority interventions within the LULUCF sector, along with reforestation, agroforestry, reduction of timber extraction and enhanced monitoring of forests. Notably, these additional interventions in the LULUCF sector also contribute to into the REDD+ mechanism by helping to improve overall management of the LULUCF sector.

Overall Policy of the State

The ER-P is one tool by which the Republic of Madagascar can contribute to the sustainable development policy developed by the government. This policy is part of the Overall State Policy (PGE), that states the following vision: "To build a new Madagascar, a strong Madagascar, and thus leave to future generations a peaceful, united and prosperous country, which managed to become a world leader in the valorization and

¹⁰ "Forest: Ecosystem Assuring or having a purpose to provide production services, regulatory services, support services and cultural services as defined by the Charter of the Environment, and provided by woody vegetation."

¹¹ AFR100: The African Forest Landscape Restoration Initiative is a country-led effort to bring 100 million hectares of deforested and degraded landscapes across Africa into restoration by 2030.

¹² <http://www4.unfccc.int/ndcregistry/PublishedDocuments/Madagascar%20First/Madagascar%20INDC%20Eng.pdf>

preservation of its immense natural capital while relying on a strong and inclusive growth in the service of the equitable and sustainable development of all territories".

With this vision, Madagascar is committed to achieving a green economy. In addition, in the policy letter on environment and natural resources, Madagascar's vision includes:

- A territory where natural resources benefit everyone, where forests and fisheries are used in a sustainable manner, and where the precious wood industry is characterized by international best practices;
- A territory with healthy households, clean cities, and a prosperous, efficient and environmentally friendly mining and industrial sector;
- A territory that attracts tourists in search of the last bastions of biodiversity, traditions and hospitality, as well as unique landscapes;
- A Regional Sensitive Site for Sustainability and Biodiversity Research;

National Development Plan (NDP)

The NDP is the official national strategy development and poverty reduction. The NDP was developed in 2013 and includes 5 strategic development axes. Axis 5 of the NDP focuses on preserving the natural capital and reducing the negative effects of climate change. Two specific objectives include (i) Linking natural resource management to economic development, and (ii) Protecting, conserving and sustainably using the natural capital and ecosystems.

National Policy to Combat Climate Change

In 2010 Madagascar adopted its National Policy to Combat Climate Change (PNLCC by its acronym in French). This policy instrument highlights priorities in both mitigation and adaptation which underpin the country's efforts to implement REDD+ at scale.

The Environmental Plan for Sustainable Development (PEDD)

The PEDD, intended as a strategic reference document for Madagascar for environmental management and sustainable development, is currently under development. The draft of the document exists, but the final version has not yet been officially adopted by the Government.

The PEDD has identified three goals to be addressed in line with those of REDD+:

1. Green infrastructure, service providers guaranteeing socio-economic resilience and sustainable production;
2. Economic productivity growth based on the valuation of the natural capital;
3. An equitable sharing of the benefits of Nature for equitable and sustainable development in all territories.

The implementation strategy of the PEDD aligns closely with the intended outcomes of the ER-P:

- Reconciling the conservation of the natural capital and development to build the socioeconomic resilience of the country;
- Systematically emphasizing decentralization and local development to increase the responsibility of collectivities and communities in the governance of the natural resources in their territory;

- Installing reliable information and monitoring systems for the governance of natural resources at the national level.

At an international level, Madagascar's commitment to REDD+ is reflected in the ratification of numerous conventions and agreements including the International Tropical Timber Convention (ITTC), the texts of the Consistency of Investments with the Environment (MECIE), and Madagascar's commitment to the conservation and sustainable management of natural resources and the United Nation Framework Convention on Climate Change (UNFCCC).

Development of a National Legal and Technical REDD+ Framework

Existence of REDD+ pilot projects is seen by the government as a major opportunity for the national REDD+ process and for the program. While the issues around transfer of title, benefit sharing, and reference level must be addressed, all parties are committed to a resolution that supports the ER-Program and integrates the projects in a transparent manner, ensuring environmental integrity and effectiveness of interventions. In order to clarify and establish clear and coherent rules for REDD+ in Madagascar, the Government seeks to implement REDD+ tailored to the national context of an increasing trend of deforestation and existing projects and REDD+ initiatives. In order to create a financial mechanism that recognizes progress in reducing emissions against Madagascar's rising forest emissions rates, and to sell and transfer emission reductions to the widest possible range of buyers. Development of such National Legal and technical REDD+ Framework is in the early stages. But Madagascar aims to have this framework designed by mid-June 2018, and then ensure its implementation during the first phase of the program (during the ERPA).

3. ER PROGRAM LOCATION

3.1. ACCOUNTING AREA OF THE ER PROGRAM

The ER-P is located along the escarpment of the mountain range in the Eastern part of the country, representing a significant portion of the main rainforest massif of Madagascar. The area is crucial for Madagascar's biological diversity, as it includes a bastion of habitat for threatened plant¹³ and animal species of global importance with a very high level of endemism¹⁴.

The ER-P area covers a total of 6,235,200 ha (approximately 10 percent of the Malagasy territory) including 1,173,928 ha of intact primary forests (PF) (19 percent of the total ER-P area), and 1,132,327 ha of degraded or modified natural forests (MNF), (18 percent of the total ER-P area).

The accounting area is consistent with the strategy of the program that seeks to intervene at the nexus of forest conservation and rural development. This approach embodies multisector land use planning based on geographically and socially coherent blocks: watersheds. The current boundaries of the program resulted from a phased analysis and are based on several criteria:

- **High potential for REDD+:**
 - **High forest cover and carbon stock:** the ER-P area is concentrated around the country's rainforests, areas with the highest carbon stocks of all ecosystems in Madagascar (around 200 Mg/ha)^{15,16}. The ER-P includes 60 percent of the country's rainforest (2,212,385 ha of 3,899,795 ha nationally (PERR-FH))
 - **Deforestation hotspots:** These forests are facing important deforestation and degradation pressures, associated GHG emissions are among the highest in the nation¹⁷. The area has significant historical and ongoing deforestation rates, threatening not only biodiversity, but also the activities and the development of local populations.
 - **High capacity for carbon stock enhancement:** The program area includes not only standing intact forest but also secondary forest (post slash-and-burn regenerated forest) and deforested areas, which have significant regeneration capacity due to the region's high rainfall. The ER-P will implement reforestation and restoration of forest landscapes to boost carbon stocks and ecosystem services. Focusing on regeneration will additionally support increased buffers for the standing primary forests, and will be closely linked to the

¹³ Dumetz, N. (1999). High plant diversity of lowland rainforest vestiges in eastern Madagascar. *Biodiversity and Conservation*, 8(2), 273-315.

¹⁴ Goodman, S. M., & Benstead, J. P. (2005). Updated estimates of biotic diversity and endemism for Madagascar. *Oryx*, 39(01), 73-77.

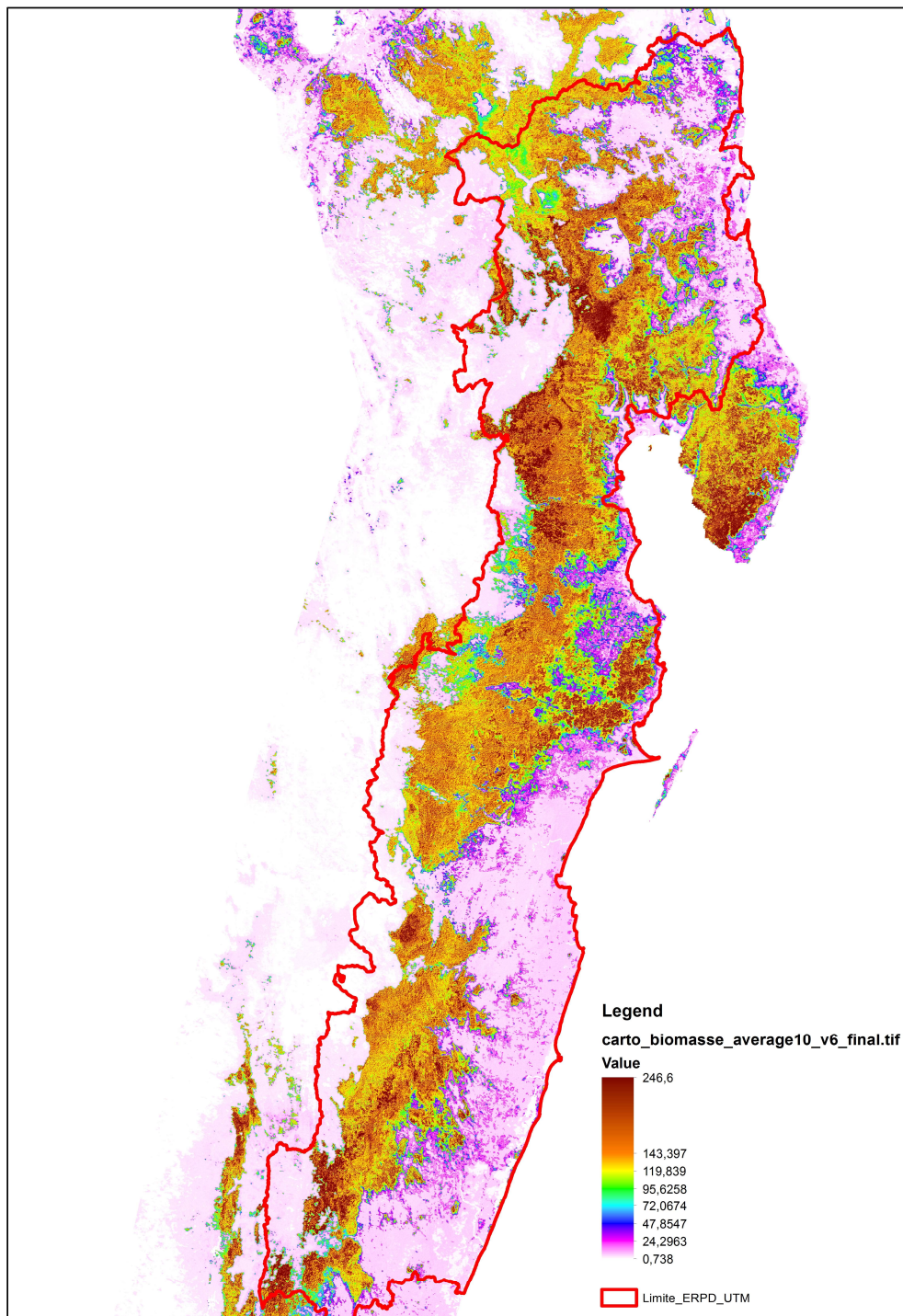
¹⁵ Saatchi et al (2011) : Benchmark map of forest carbon stocks in tropical regions across three continents. In: *Proceedings of the National Academy of Sciences of the United States of America - PNAS*, Vol. 108, No. 24, 14.06.2011, p. 9899-9904

¹⁶ Eco-Regional REDD+ Project for the Easter Humid Forest (PERR-FH by its acronym in French)

¹⁷ Salva Terra, 2017

economic livelihood activities of rural communities that have continued to increase pressure on forest resources.

Figure 3 – Above ground biomass within ER-P area (in Mg/ha)



- Coherent geographical dimension for reducing poverty and forest conservation:
 - A continuum of 19 watersheds, with potential for cost effective interventions (linking forest conservation and development activities): 15 type 1 watersheds, i.e.: oriented

towards the eastern seaboard; 2 type 2 watersheds, i.e.: oriented towards the interior of the land;

- Aligned with administrative boundaries: delineated based on the contours of communes. The administrative building block of the ER-P is the commune. The administrative boundaries of “regions”, while representing political boundaries at a relatively large scale do not represent consistency nor homogeneity regarding afore mentioned criteria (forest cover and carbon stocks, drivers of deforestation, watersheds) relevant to addressing deforestation. Thus, the smaller administrative level of commune is better suited for efficiency and more effective planning. The area of implementation contains 184 full communes located in 5 regions of Madagascar as follow:

Figure 4- Watersheds and deforestation (2005 – 2013) within the ER-P area

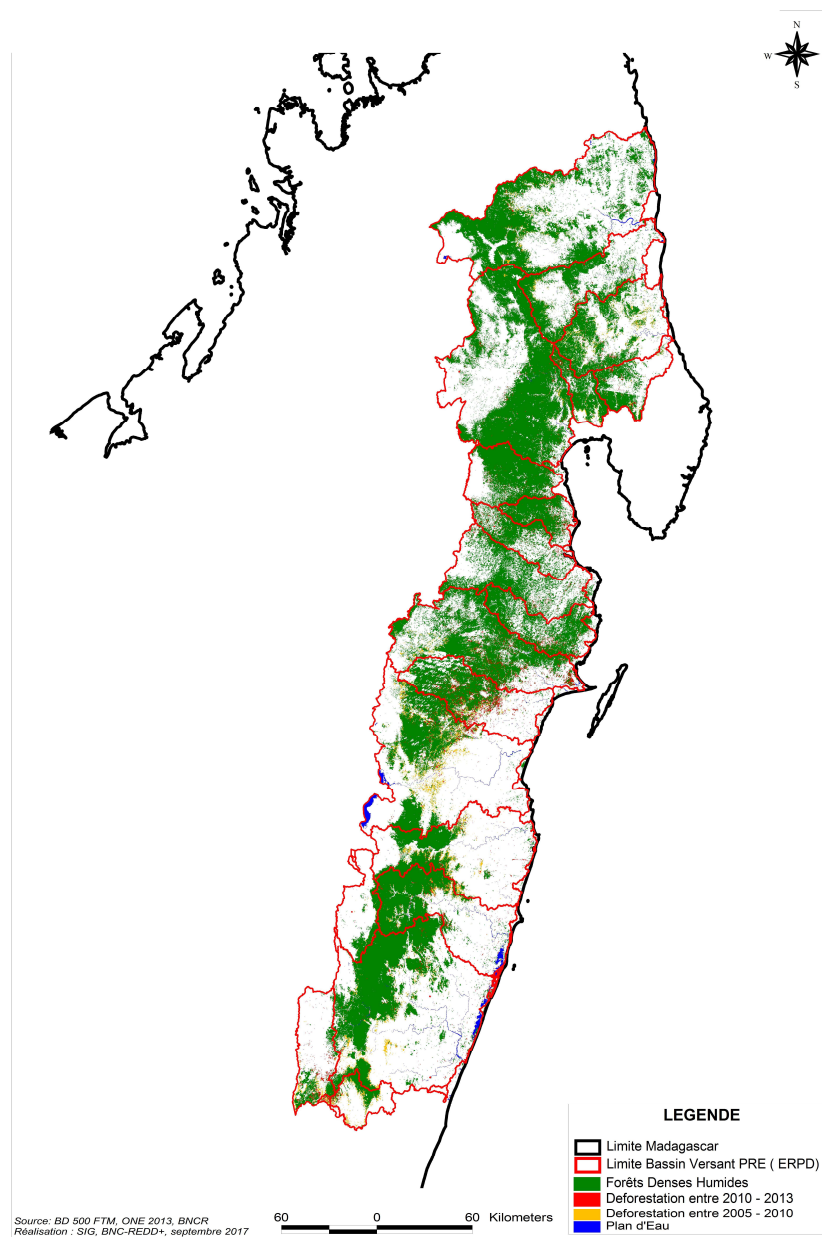


Figure 5 - Communes of each regions within the ER-P area

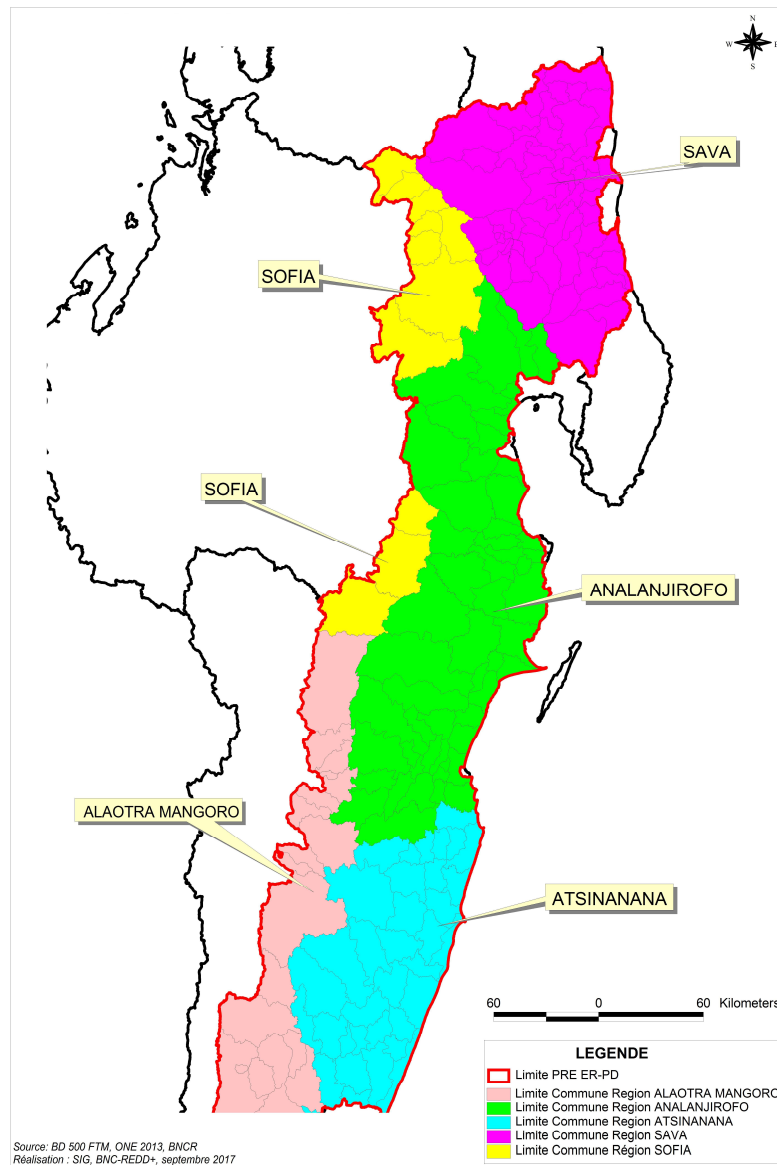


Table 1 - Repartition of communes between regions of the ER-P

Region	Numbers of communes	Surface of each portion of the region within the ER-P (in ha)	% of surface within ER-P
SAVA	58	1,309,392	21%
Sofia	11	748,224	12%
Alaotra Mangoro	20	997,632	16%
Analanjirifo	58	2,057,616	33%
Atsinanana	37	1,122,336	18%

- **Presence of critical criteria for efficiency within the 5-year ERPA time frame:**
 - **Presence of land-tenure management offices within communes.** Different analyses of drivers of deforestation cannot clearly state that communal land-tenure offices have positive impacts on reducing deforestation. However, it is clear that their presence will facilitate and catalyze the implementation of the program activities as they will contribute to securing land tenure and enhance land-use planning;
 - **Existing sub-projects and interventions linked to reducing deforestation:** Various projects and activities in the ER-P area contribute to conservation and to the enhancement of carbon stocks. It was deemed essential for the ER-P to build on these initiatives, contribute to their sustainability or even increase their scale of implementation to lay a strong foundation for scaling-up and for the performance of the ER-P as a whole. It is also seen as an opportunity to consolidate gains within these projects which remain tenuous in the face of unsecured financing. The ongoing success of these projects and their presence within the ER-P area is a key advantage of the ER-P design. The projects haven proven that engagement with local actors can contribute to reducing GHG emissions and the projects within the ER-P are considered as up-front financing. At the same time, and as explained before, program activities will aim at contributing to local development, mainly through agriculture. The PADAP project was designed within the frame of reducing ERs through improved agriculture and land-use management the delineation of the program includes three watersheds (to distinguish from primary watersheds delineation shown in Figure 4) where the project will intervene.

Figure 6 - Location of Protected Area within the accounting area

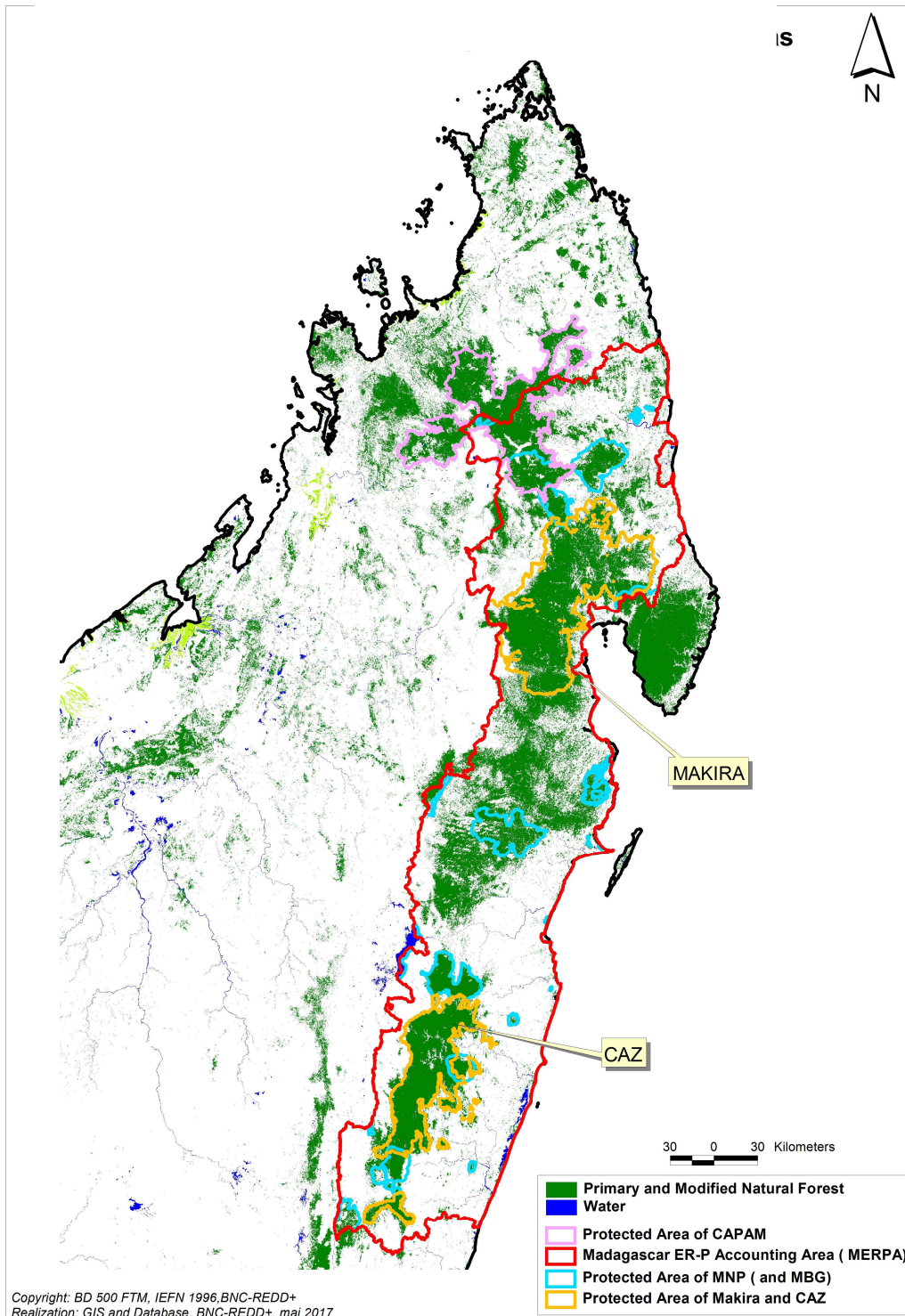
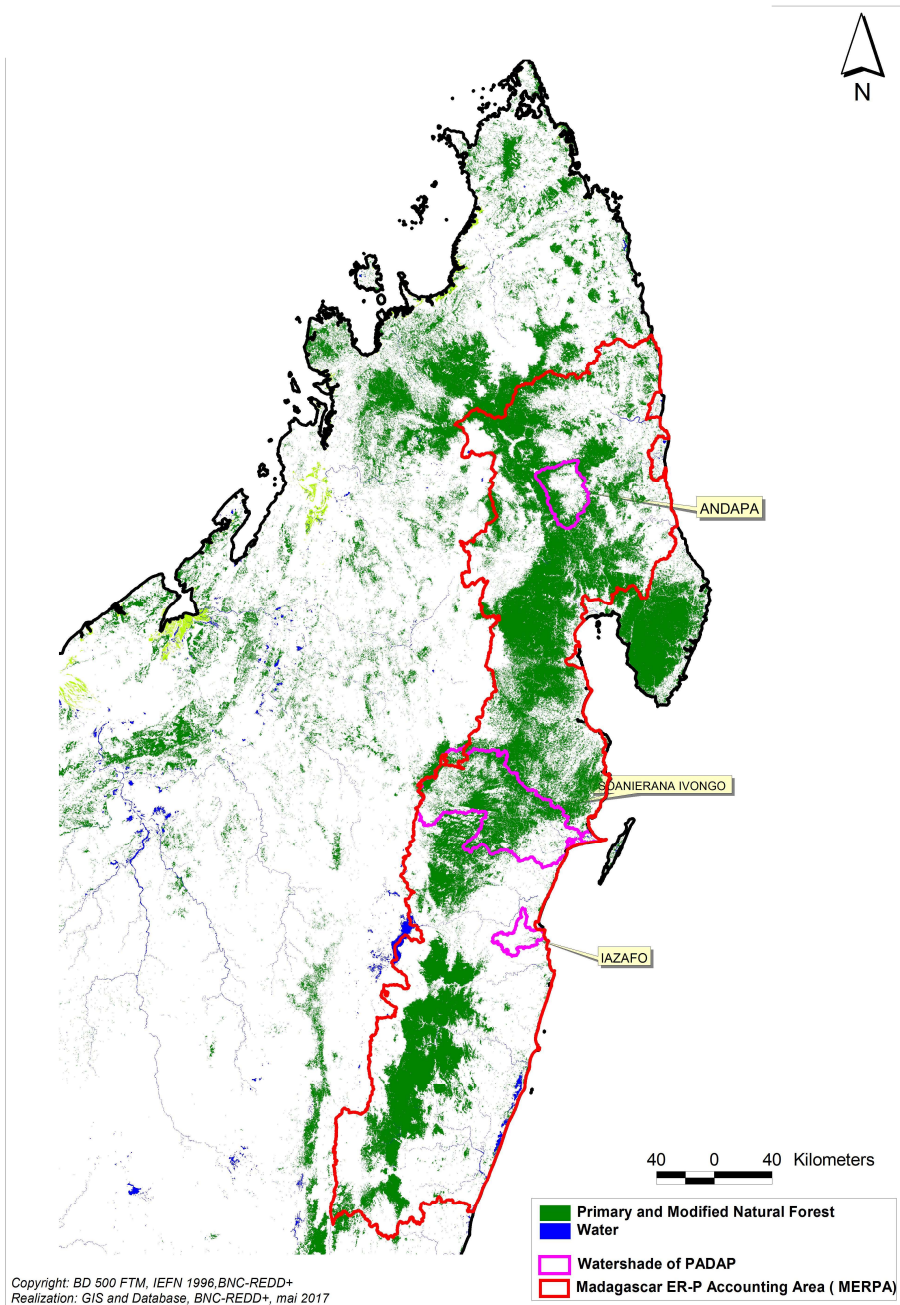


Figure 7 - PADAP watersheds within the ER-P area



3.2. ENVIRONMENTAL AND SOCIAL CONDITIONS IN THE ACCOUNTING AREA OF THE ER PROGRAM

a. *Environmental conditions*

Type of vegetation

In 1994, a National Forest Ecologic Inventory (IEFN) was undertaken in order to determine the location and spatial distribution of various forest formations, their main dendrologic and dendrometric characteristics, some of their floristic and faunistic parameters and their shifting trends. This inventory thus allowed to describe the phytogeographic domains of the ER-P.

Table 2 : Phytogeographic areas and AGB stocks

Phytogeographic areas (IEFN 1994)	Types of forests/thickets	Stocks (Tc/ha)	AGB
A. Areas of East and Sambirano (0 to 800 m)	Coastal forests	95	
	Lowland evergreen dense rainforests	158	
	Degraded lowland evergreen dense rainforests	45	
B. Areas of the Center – Eastern slopes of middle altitude (800 – 1800 m)	Average Altitude evergreen rainforests	142	
	Degraded average altitude evergreen dense rainforests	48	

Major segments of remaining forests are average altitude and lowland evergreen dense rainforests, with high AGB stocks and biodiversity.

In 2016, REDD+ readiness resources enabled another forest and ecological inventory carried out by DVRF of the eastern rainforests. During the more recent inventory data were collected to provide crucial information on secondary forest formations that were not available through the IEFN, and to inventory the ecologic integrity of low and mid-altitude rainforests (included in the PERR-FH zone).

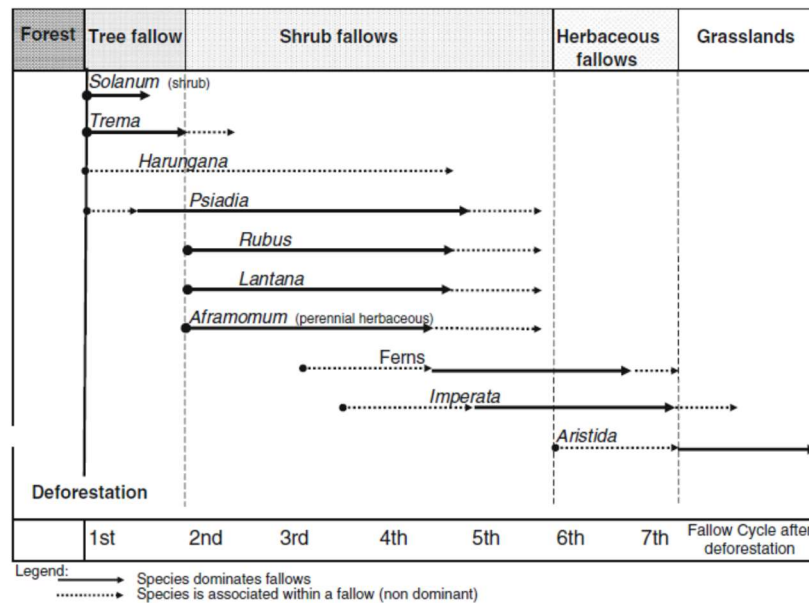
From an ecological point of view, this inventory was based on the definition of 5 strata of different secondary formations linked to the different phases during and after the practice of “*tavy*”, slash and burn agriculture. These strata were not taken into account in the development of the reference levels (REL) for this ER-P, because it is not currently possible to precisely map each stratum through spatial analysis and then quantify their respective surfaces within the ER-P. The strata that have been mapped and used for REL calculation are described in section 8.2. However, the information on secondary formations (including first forest stage) after *tavy* are crucial for the program because they constitute the main lands where reforestation or restoration of forest cover are envisaged (for carbon stock enhancement).

Box 1. The “Tavy” system.

The “Tavy” system

According to Andriamanjara et al. (2016): “In Eastern Madagascar, traditional farming practices of slash and burn, in which the forest is replaced for agriculture by cutting and burning the trees followed by agricultural cycles interspersed with fallow periods, lead to vegetation changes marked by transition of primary forest to grassland (Styger et al., 2007).

The first fallow cycle after deforestation is associated with a tree fallow system where vegetation types are dominated by *Trema orientalis* and *Harungana madagascariensis*. From the second to the fifth fallow cycle after deforestation, endemic shrubs, dominated by *Psidia atlissima* and exotic and invasive species dominated by *Rubus moluccanus* or *Lantana camara*, replace the previous tree fallow species resulting in shrub fallow landscapes. Beyond the sixth fallow cycle herbaceous fallows or grasslands dominate, marked by development of grass species and ferns, *Imperata cylindrica*, and *Aristida sp.*^{18,19} (Styger et al., 2009; Styger et al., 2007)”.^{18,19}



Climate Conditions

The entire area of implementation is subject to a unimodal tropical climate characterized by alternating rainy (November - April) and dry seasons (May - October). The lengths vary from region to region, but also by distance from the east coast and the "protection" effect associated with the escarpment. Altitude increases temperature variations: the dry season can be particularly cool on the highlands –where it can

¹⁸ Styger, E., Rakotondramasy, H.M., Pfeffer, M.J., Erick, C.M., Fernandes, E.C.M., Bates, D.M., 2007. Influence of slash-and-burn farming practices on fallow succession and land degradation in the rainforest region of Madagascar. *Agric. Ecosyst. Environ.* 119 (3–4), 257–269.

¹⁹ Styger, E., Fernandes, E.C.M., Rakotondramasy, H.M., Rajaobelinirina, E., 2009. Degrading uplands in the rainforest region of Madagascar: fallow biomass, nutrient stocks, and soil nutrient availability. *Agrofor. Syst.* 77 (2), 107–122.

sporadically freeze. The dry season is generally less than five months long over the entire ER-P implementation area.

According to a study carried out by Cornet, A. (1974)²⁰, the bioclimatic classification of Madagascar was made according to the values of the accumulated water deficit and the average of the minima of the coldest month. In this context, the geographic distribution of the ER-P bioclimates belong to the humid zone with a cumulative water deficit of less than 100 mm and includes the entire eastern escarpment of the island. This humid zone can be divided into two sub-zones:

- A hyper-humid sub-zone for which the deficit is constantly zero. This subgrade includes the East Coast of Sambava at the southern tip of the ER-P from 0 to 700 m altitude.
- A humid under-zone characterized by a non-zero but weak water deficit occupies the rest of the eastern slope.

Every year in the middle of the rainy season (January - March), Madagascar is affected by damage caused by cyclones that come from the Indian Ocean or the Mozambique channel, with a frequency of at least one cyclone per year. The entire area of implementation of the ER-P is equally subject to cyclone risks. The impact of the cyclones on local populations is often dramatic. While these cyclones do not contribute to deforestation, they do play a role in forest degradation (see section 11).

Soils

The geology of Madagascar is divided into two major groups (Besairie, 1973²¹)

- Sedimentary rocks that occupy all coastal areas, which is one-third of the island;
- The crystalline base on which the highlands and the escarpment rest, i.e.: two thirds of the island and the vast majority of the area of implementation of the program.

The presence of lava (basalt and gabbro) along the eastern coast of the Atsinanana region is pronounced.

The works of Roederer (1971)²² classify the Malagasy soils in four different types:

- Ferrallitic soils with several variants, depending on the bedrock. These are the most widespread soils on the Highlands and the East Coast, occupying about 46% of the island's surface;
- Hydromorphic soils, more or less peaty, occupy the lowlands and are mainly used for rice growing (6.5 percent of the surface of the island);
- Alluvial soils, which are slightly developed but very fertile, are mostly found in the immediate vicinity of the great rivers of the western region (26% percentof the surface of the island).
- Ferruginous tropical soils, which form very large areas in the West and South, which account for 27.5 percent of the island;
- These soils suffer to varying extents from erosion, due to both topography and anthropic actions such as bush fires and deforestation.

²⁰ Cornet, A. (1974). Essai de cartographie bioclimatique à Madagascar

²¹ Besairie, H. (1973). *La géologie globale et ses applications à l'océan indien et à Madagascar*. Repoblika Malagasy, Ministère de l'économie, et des finances, Direction générale de l'économie, Direction des mines et de l'énergie, Service géologique

²² Roederer, P. (1971). Les sols de Madagascar. Sciences de la terre, Pédologie, 5.

The ER-P area is thus mainly composed of Ferrallitic and hydromorphic soils. The Eastern Forest Inventory carried out in 2016 confirmed that forest soils all belong to the class of Ferrallitic soils corresponding to a tropical humid climate. The color of the soil is usually dark (brown) indicating its richness in organic matter. The depth of the litter (reserve of organic matter) varies according to the type of vegetation. The primary forest is characterized by a more or less deep litter (5 to 10 cm), which decreases according to the level of degradation of the vegetation (less than 2 cm for the Agroforestry stratum). In addition, the high biological activity in the rhizosphere improves the physical quality of the soil (texture, structure).

Presence of threatened species and habitats

Madagascar is one of eight “hottest” biodiversity hotspots in the world based on richness and endemism of plants (more than 90 % of endemic species²³) and vertebrates (50% endemism in birds and >98% in amphibians, reptiles and mammals²⁴), and on habitat loss (estimated at >90%²⁵). Madagascar also stands out because of its endemism at higher taxonomic levels (genera and families) among plants and vertebrates²⁶.

According to the International Union for Conservation of Nature (IUCN) Global Red List data, **Madagascar is currently considered as a priority conservation area**, with 88.5% of lemur species and almost 4% of Malagasy plants are threatened with extinction. The situation is also alarming for orchids (48% endangered), palms (72% threatened) and 136 species of terrestrial reptiles (endangered and/or threatened).

The flora of Madagascar alone includes about 10,000 species of endemic higher plants. Endemism is not present the only at the species level, but also in higher taxonomy: eight plant families, five families of birds, five families of primates and all of the listed amphibian species are not represented anywhere else in the world.

As shown previously, the ER-P implementation area is crucial for Madagascar’s biological diversity, as it represents part of the last bastion of the eastern rainforests. These forests contain the habitat of a majority of plant²⁷ and animal species of global importance with a very high level of endemism²⁸.

b. Social conditions in the accounting area

²³ Schatz, G.E. (2000) Endemism in the Malagasy tree flora. In *Biogeography of Madagascar* (eds W.R. Lourenço and S.M. Goodman), pp. 1±9. Memoires de la Société de Biogéographie, Paris.

²⁴ Langrand, O. & Wilmé, L. (1997) Effects of forest fragmentation on extinction patterns of the endemic avifauna on the central high plateau of Madagascar. In *Natural Change and Human Impact in Madagascar* (eds S.M. Goodman and B.D. Patterson), pp. 280±305. Smithsonian Institution Press, Washington DC.

²⁵ Lowry, P.P., II, Schatz, G.E. & Phillipson, P.B. (1997) The classification of natural and anthropogenic vegetation in Madagascar. In *Natural Change and Human Impact in Madagascar* (eds S.M. Goodman and B.D. Patterson)

²⁶ Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B. & Kents, J. (2000) Biodiversity hotspots for conservation priorities. *Nature*, RHQD 853±858.

²⁷ Dumetz, N. (1999). High plant diversity of lowland rainforest vestiges in eastern Madagascar. *Biodiversity and Conservation*, 8(2), 273-315.

²⁸ Goodman, S. M., & Benstead, J. P. (2005). Updated estimates of biotic diversity and endemism for Madagascar. *Oryx*, 39(01), 73-77.

The current population of Madagascar is approximately 23 million inhabitants, with an average density of 34 inhabitants per km² nationally. Population growth is relatively high. The country has increased in population from less than 2 million inhabitants in 1900 to 23 million today, with an estimated annual growth rate of 2.8 percent. The population is expected to reach 35 million by the year 2030. The majority of the population lives in rural areas and are predominantly poor.

Agriculture is the primary occupation of households within the ER-P area, a reflection of the significance of the industry in Madagascar. Agriculture is the pillar of Madagascar's economy: it employs 80 percent of Malagasy households on 2.5 million hectares of farms and accounts for 27 percent of GDP and 47 percent of primary GDP (MAEP, 2007, INSTAT, 2006). While the average area of the individual farm is generally small (0.87 ha), the potential agricultural area for arable crops, grazing areas and ranching is estimated at more than 35 million hectares. Aside from subsistence farming, there are export-oriented crops (rice, sugarcane, vanilla, cocoa, litchis, etc.) that provide significant currency receipts on a case-by-case basis.

Despite significant potential, the sector performs poorly. Irrigated agriculture accounts for 70 percent of agricultural production and for 88 percent of rice production (MAEP, 2010), meaning the sector is heavily dependent on water resources.

Madagascar remains below its potential for various commodities (essential oils, spices, fruits and vegetables in particular). Other economic activities exist, such as livestock, fisheries, mining and tourism, but these activities are still at an early stage of development and need better regulation and assistance of targeted policy reforms as well as increased investment in order to become more robust and widespread. The overall poor performance of the sector due to structural weaknesses, environmental degradation, the use of traditional and low-intensity technologies, low utilization of agricultural inputs, low access to equipment, difficult access to land and exposure to natural disasters and locust invasions. Education is an important determinant of agricultural productivity, and access to education seems an important determinant for a raise in expenditure levels and welfare²⁹.

²⁹ Randrianarisoa, J. C., & Minten, B. (2001). Agricultural production, agricultural land and rural poverty in Madagascar.

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

4.1. ANALYSIS OF FACTORS AND UNDERLYING CAUSES OF DEFORESTATION AND FOREST DEGRADATION AND EXISTING ACTIVITIES THAT CAN LEAD TO CONSERVATION OR ENHANCEMENT OF FOREST CARBON STOCKS

Analyses of the drivers of deforestation and forest degradation countrywide and in the different ecoregions has unveiled numerous complexities:

- Methodological - difficulties in reconciling the need to provide general conclusions while considering local specificities, accounting for the complexity of the processes of deforestation and degradation while providing information relevant to the whole jurisdiction, or country;
- Technical - lack of data, reliability of data, difficulty in collecting data in a country where transport constraints are very high, limitations of modeling tools, etc.
- Deforestation and forest degradation are "complex and multifaceted processes" (GEIST and LAMBIN, 2001)³⁰, and so are their drivers. Deforestation and degradation arise from the complex interaction of both direct factors (human activities that directly affect forest cover and result in loss of carbon stocks) and indirect factors (complex social, economic, cultural, and political interactions and technological processes at multiple scales) that have an impact on the immediate factors causing deforestation and degradation.
- Highly challenging to demonstrate direct and indirect factors at a jurisdictional scale while recognizing the local differences in these drivers. Even in areas where it is relatively feasible to identify or even quantify a particular factor that stands out, details on the weight of each direct and indirect cause, which are interrelated, are difficult to quantify.
- Categorizing drivers at an eco-regional scale requires an articulation of the relationships between the drivers and the processes linking the drivers, with an understanding that there will be some variations that reflect local specificities. In terms of the implementation of activities, it is key that these local specificities are taken into account and appropriately addressed at the local level in a transparent and participatory decision-making process (see Section 6.1).

The assessment of drivers for the ER-P included the following sources of inputs:

- Political economy of deforestation and degradation analysis
- Consultations yielding data and subsequent socio-economic, socio-political, socio-cultural analyses
- Regulatory reforms with respect to REDD+ in Madagascar (respectively LRA 2016 and LRA 2017)
- Existing studies on deforestation and forest degradation

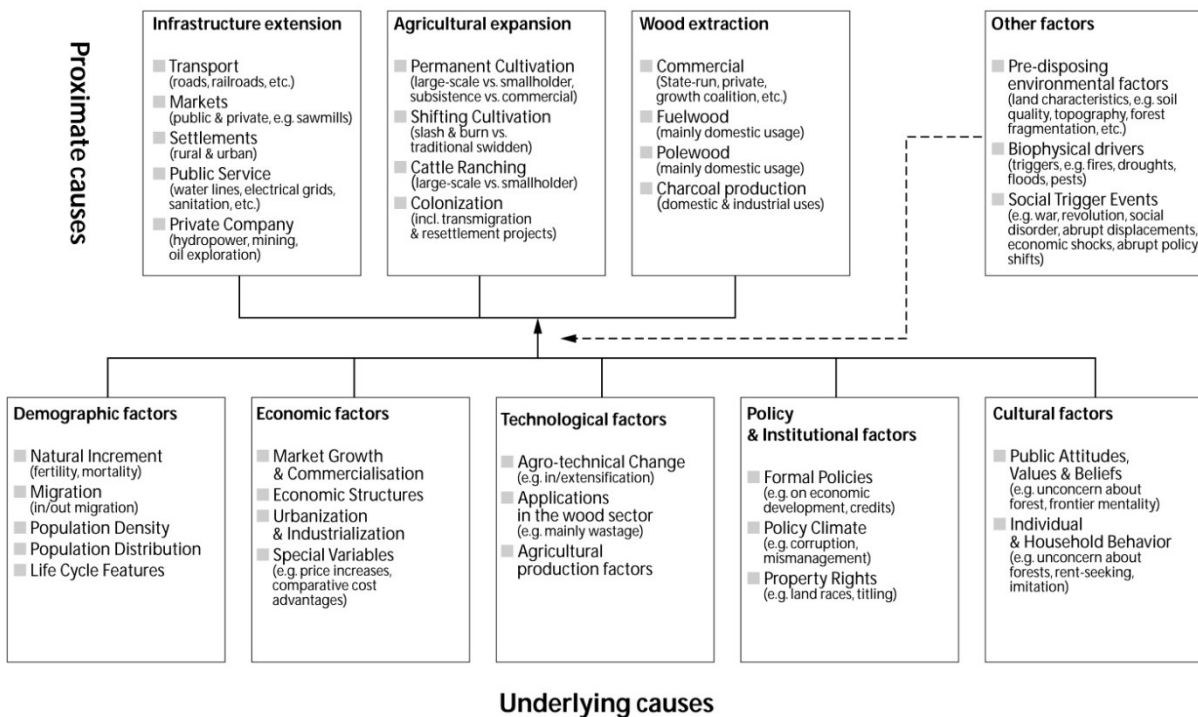
³⁰ Geist, H. J., & Lambin, E. F. (2001). What drives tropical deforestation. LUCR Report series, 4, 116.

This driver's analysis identified the direct causes for deforestation and degradation of the eastern rainforests, spatially explicit at the regional scale. The findings were discussed with local stakeholders through a series of 10 workshops (PERR-FH 2014), and further corroborated through field surveys and spatial analysis (Salva Terra 2017). The direct causes identified are classified in five categories:

- Agriculture: slash and burn subsistence farming and cash cropping;
- Energy: collection of firewood; production of charcoal;
- Mining: rare earth minerals; artisanal mining - specifically gold, precious stones; illegal mining;
- Forest harvesting: illegal logging - timber, precious wood; charcoal production;
- Livestock: pasture fires; grazing zebus in the forest.

In order to systematically and efficiently evaluate all the inputs for the driver analysis, the information was organized according to the internationally recognized framework of Geist and Lambin³¹.

Figure 8 Geist and Lambin's framework (GEIST & LAMBIN, 2001)



³¹ Lambin, E. F., Turner, B. L., Geist, H. J., Agbola, S. B., Angelsen, A., Bruce, J. W., ... & George, P. (2001). The causes of land-use and land-cover change: moving beyond the myths. *Global environmental change*, 11(4), 261-269

a. *The direct causes for deforestation and forest degradation*

Expansion of agriculture

i. Annual crops

Literature unanimously identifies slash-and-burn as the primary driver of deforestation, called “tavy” in the context of eastern rainforests in Madagascar. The annual crops grown in the ER-P area are almost exclusively dedicated to subsistence farming, and low yields, low access to markets, and lack of agricultural intensification technologies, have limited the establishment of industrial agricultural production. Tavy usually involves first clearing a plot of forest, cultivation of rain-fed rice (for self-consumption) followed by maize, cassava, sweet potatoes, and then a period of fallow. During the period of fallow, the farmer will open a new plot of land and repeat the cycle.

Throughout the ER-P area, the rotation time is usually longer than 5 years. Rotation time is an essential feature of slash-and-burn cultivation systems because it determines the rate of progression of the deforestation front for the opening of new plots. In rainforests, rotation periods are relatively long compared with the dry forests in the west, and deforestation and end-of-rotation crops are separated in time because of the continuing degradation that is not categorized as deforestation. Tavy causes permanent deforestation, since the regular use of fire during end-of-cycle fallows and before crop rotations effectively makes forest regeneration impossible, despite the potential for revegetation due to the high rainfall

Tavy remains the most competitive agricultural system in the region, and is the most commonly practiced. However, farmers across Madagascar are reluctant to say they practice tavy, though evidence indicates that slash-and-burn agriculture is widespread. The main indicator of tavy is the stagnation of crop yields, which can only be explained by this practice (a non-tavy, more modern or intensified system would produce measurably higher yields). Increasing household needs often lead to expansion of tavy plots and new deforestation, rather than agricultural innovation. Further, agricultural innovation is very low in this area, which relies on traditional seeds, manual plowing, basic equipment, almost nonexistent agricultural supervision, rare use of fertilizers. Lack of available land in plains and lowlands encourage rain-fed cultivation and clearing.

ii. Permanent crops

In the eastern rainforests, permanent crops are demonstrated to be responsible for deforestation, overall. The largest areas are located mainly in an 80-km wide coastal strip in the Brickaville, Mahanoro, Marolambo and Toamasina II districts of the Atsinanana region and in the Fénériver Est and Vavatenina districts of the Analanjirofo region, as well as in the districts of the Sava region (Sambava, Andapa, Antalaha and Vohemar). Perennial crops (coffee, cloves and vanilla in particular) have had a deforestation impact in the last decade. However, anecdotal information has highlighted that the cultivation of vanilla, cloves and sometimes coffee has in some cases limited deforestation.

These competing findings are the result of the complex reality at local level. The process of planting lucrative perennial crops follows two phases: first, (and a negative phase in terms of REDD+) farmers are encouraged to deforest to create parcels dedicated to cash crops, and second, (positive in terms of REDD+) farmers use previously cleared areas (savoka) to grow agro-forestry crops. The degraded lands are numerous and conducive to the installation of these agro-forestry crops, hence a stabilization or even a reduction in deforestation.

iii. Livestock and pasture fires

In the ER-P area, both spatial analyses and analyses based on household surveys show that livestock farming is not an important direct driver of deforestation in intact forests, but if forest grazing exists, it mainly contributes to forest degradation in secondary forest formations.

Bush fires—a part of grazing patterns to encourage regeneration—are frequently mentioned in literature as a pressure on forests, and concern all zones and types of forests, especially secondary formations. These fires contribute to the degradation of soils and limit regeneration of carbon stocks and forests. Further, trees felled as a result of cyclones increase the effects and intensity of bush fires, as does forest degradation caused by grazing in forest edges, and firewood and domestic wood harvesting. Although the specific causes of individual fires vary depending on the local context, in-general, human-induced burns clear or prepare plots for tavy (or even annual crop) and regenerate land for grazing and are the main causes of fires.

It should be noted that there are other causes for fires, but these are considered marginal compared to tavy and pasture fires. They include: cooking in the forest, cigarette butts left behind by smokers, charcoal grinders, illegal bandits (Dahalo), hunting practices using fire to flush out prey, protests and acts of vengeance or jealousy, and smoking of bees.

The prevalence of bush fire to make way for tavy and pasture show that fires—a driver of deforestation—has a clear and direct link with agricultural expansion.

Wood harvesting

i. Firewood and charcoal

A large portion (80 to 90 percent) of the energy needs of Malagasy households are met by fuel wood—charred and/or raw. For example, in 2009, nine million cubic meters of wood were used directly as firewood, compared to eight million cubic meters used for charcoal production (JariAla 2009). Today, wood consumption for charcoal is thought to be the majority.

The impact of fuel wood and charcoal on forests differs depending on the area under consideration. Generally, harvesting wood for domestic raw consumption includes a wide variety of species in natural

forests, with a larger impact on degradation and a marginal impact on deforestation. Whereas, the impact of harvesting wood for charcoal is less conclusive.

Consultations during the driver analysis identified divergent perspectives regarding the origin of charred wood: for some households, it is mainly wood coming from cleared parcels. The production of charcoal would then be an opportunistic activity, the clearing being motivated by the intention to cultivate. Others mention significant removals of natural forests for intentional charcoal production.

Although nationally, the majority of consumed charcoal mainly comes from eucalyptus plantations in the highlands, in the ER-P area, and according to consultations, charcoal has a more important local impact on forests, because of an increase in the amount of firewood transported to certain urban areas (ex. Fénérie Est Charcoal is predominantly consumed by households, at a low volume overall, as the market to export charcoal to urban areas is poorly developed).

ii. Construction, softwood and service lumber

In rainforests across Madagascar, timber harvesting for construction, softwood and service (C/O/S) now seems to have little impact on deforestation. The legal market for these products is small, and the limited information available on the large-scale illegal logging of precious wood (rosewood, ebony, etc.) mainly mentions the post-crisis boom of 2009. The majority of timber volumes (for C/O/S) are harvested in the Northeastern Regions (except for rosewood and ebony that are exploited everywhere throughout the ER-P), including in protected areas, and exported. After 2009, the country saw a fivefold increase in the volume of rosewood harvested, mainly exported to Asia. As the marketing of rosewood in the Northeast now mainly relies on stocks already harvested, new species are the target of illegal exploitation (e.g.: pallissander). This dynamic could explain part of the degradation observed over the period 2005-2013 but does not seem to be as important in the current socio-economic processes causing deforestation.

Whereas the influence of the proximity of cities does not emerge from spatial analyses, sporadic cases of influence on forest degradation were highlighted as notable during consultations.

Although there is undeniable overexploitation of certain species (no cutting inventory, corruption of agents, etc.), as well as large losses during processing (40 to 80 percent of the harvested wood is lost), it is important to note that the exploitation of timber posteriori promotes the migration and infiltration of villagers into the massifs once opened. Access roads used during the exploitation can trigger more intense degradation and the subsequent deforestation if these populations practice agriculture or livestock husbandry on these newly accessible areas. However, without reliable and disaggregated data on legally and illegally exploited volumes, it is difficult to estimate the full impact of timber harvesting.

Extension of infrastructure

i. Transport

Quantitatively, the opening of roads has had few measurable direct impacts on deforestation in recent years due to the fact that few new roads have been created. However, the low general accessibility of

forests can concentrate the pressures (harvesting activities, slash-and-burn cultivation, etc.) on the few more accessible forest areas. In addition, as noted above, unofficial logging roads can lead to degradation and subsequent deforestation.

In the ER-P and in Madagascar in general, roads can help locate and predict forest-related pressures within the territories. If roads are scarce (low road density and low average forest-road proximity), pressures are concentrated in a restricted area due to the presence of a road and deforestation may be significant. If, on the other hand, traffic is facilitated within the District (high road density), pressure will be spread and deforestation will be less significant, or even replaced by degradation

ii. Mines

Madagascar is known all over the world for its precious and semi-precious stones: sapphire, ruby, emerald, aquamarine, tourmaline, topaz, amethyst, etc. Several tons of gold are produced annually by craftsmen, sometimes grouped into partially mechanized cooperatives. In addition to colored stones and gold, many workers exploit ornamental stones, industrial minerals (quartz, mica, feldspar) and building materials (marble, kaolin, gypsum). In 2012, the Ambatovy mining project, which mines for nickel and cobalt (and produces ammonium sulphate as a by-product from refining) was launched as a world-class industrial project in the ER-P area.

Mining projects generate expectations in terms of employment and improvement in living conditions, which transform into frustration if the developed activity does not translate into full employment or revenues that compensate for the lack of public resources. In Madagascar, the two major mining projects, one of which is Ambatovy in the ER-P area, have developed a range of activities to meet their legal obligations or as part of their Corporate Social Responsibility (CSR) programs. But since 2009, and in general, the mining sector has often been criticized by the public, and disagreements and complaints have in some cases degenerated into social conflicts. These companies also highlight the challenges of mining endeavors as recent fluctuations in global mineral prices have limited revenues, diminished the resources for meeting CSR commitments and even caused ownership of the mining operations to change hands.

Many mining activities can be characterized as artisanal in Madagascar, and there is no formalization or management of artisanal mining practices, which poses a great number of challenges. Several initiatives have been undertaken in the past to try to formalize the artisanal exploitation of gold or precious stones, with success usually limited to the local level, and depending on the duration of technical assistance. The informal nature of the activity and smuggling remain major challenges for Madagascar, particularly with regard to REDD+. The concerned minerals share common characteristics: extraction (or collection in the case of quartz and crystal) on a small scale and artisanal (with spades, possibly crowbars, as well as panning in the specific case of gold).

The establishment of artisanal mines constitutes an important driver of forest degradation, more than deforestation, in the eastern rainforests, and in particular the Ankeniheny-Zahamena corridor (CAZ), site of one of the REDD+ projects in the ER-P. The degradation takes place on an ad hoc basis, first of all by removing timber for the needs of miners and their families including agriculture parcels, then the in-

migrations that these farms may entail, and sometimes the settlement of these populations in a definitive manner once the extraction has been completed. At the scale of the entire ecoregion and the ER-P in particular, the impact on deforestation is still low to medium when compared with the agricultural sector. It is, nevertheless necessary to take into account the extent of the sapphire and ruby rushes in the CAZ area, which have led to increased levels of encroachment in recent months and years.

SUMMARY

Deforestation in Madagascar does not take place on the basis of a single large-scale and homogeneous front in terms of activity, but rather on a small scale and according to a multitude of cases, factors and specific situations. Deforestation occurs in the areas bordering forests, within the intact forest massifs as well as in the margins of intact forests, and close to urban and agricultural areas. Over the 2005-2016 reference period, and on the basis of the available data, the explanatory variables for deforestation differ according to the period but also according to the zones within the ER-P, demonstrating a mosaic of deforestation processes that is local, and therefore difficult to generalize over the full scale of the ER-P.

Although it is expressed in different forms, traditional agriculture remains the first direct cause for deforestation. Despite varying levels of forest cover in the communes, it is systematically the variables of the agriculture category (agricultural expansion) that appear as the main causes of deforestation. Traditional agriculture includes two phases: first, traditional tavy dedicated to annual crops (see crop sequencing as described earlier in this section, and second, after 5 year rotations, installation of new high-value-added crops with increasingly important land tenure security (e.g., cash crops, coffee and vanilla).

This second step can unleash, from a REDD+ standpoint, sometimes conflicting processes. Planting of high-value crops can be an indirect driver of deforestation, but at the same time can also lead to reforestation if agroforestry is practiced on these previously-cleared plots, and can potentially maintain carbon stocks at a relatively high level, even close to that of natural forests and/or secondary formations. An agroforestry approach may create a physical buffer around natural forests. Conversely, medium to large-scale agriculture can also encourage an influx of large investors who wish to export these products, and also migration of populations to the site in search of income. Such an influx can and accelerate forest degradation and deforestation in surrounding areas.

In spite of the dominance of agriculture as a driver of deforestation, other factors of deforestation remain significant, as they have a cumulative impact, which can be more or less strongly expressed depending on the observed area:

- Bush fires related to livestock breeding and the regeneration of pasture areas – these fires can spread into secondary forests but also in the degraded edges of primary forests. This is particularly the case in areas frequently affected by cyclones, the damage of which increases the dead biomass in the forests and thus makes them more vulnerable to the spread of pasture fires;
- While fuel wood (raw wood) harvesting does not appear to have a significant impact on deforestation, charcoal production for domestic and local use contribute to deforestation, particularly in the forest massifs located relatively close to certain urban areas like Fénériver Est, Antalaha or Sambava;

- Mining, which during the reference period could be considered negligible in terms of deforestation area compared with other direct drivers, is a growing activity—particularly artisanal mining—and directly threatens the integrity of intact forests, including within protected areas (the CAZ area is already facing these pressures).

b. *Underlying causes for deforestation and forest degradation*

Demography and migration

Several articles and surveys^{32,33} reveal demographic pressure as an important driver of deforestation globally. Observations evoked during consultations in the Boeny region confirm that demography can drive deforestation, especially through migratory phenomena.

Tavy traditionally takes place in secondary forests, but limited availability of land, population growth and migration can lead to an increase of tavy in primary forests. Migration may be due to the opening of illegal artisanal mines (for example, the case of sapphire mining in the Atsimo-Andrefana Region), illegal logging, and search for fertile lands, or agricultural opportunities in cash crops as described above. Further, migration is a cultural tendency fostered by the lack of clear land tenure and land legislation. The density and distribution of the population are also recognized as explanatory variables for deforestation. The saturation of irrigated valleys pushes the youngest and the landless people to forest areas.

Unfortunately, and as stressed by the International Organization for Migration (IOM, 2013): "The issue of internal migration in Madagascar is little known: little is known about the frequency, causes and consequences of migration. It is a relatively difficult phenomenon to observe and [...] there is a shortage of numerical data".

Economic Factors

Structural poverty among rural populations is a major underlying driving force behind deforestation, as rural populations are dependent on natural resources for their subsistence and local economy. But the lack of financial resources inhibits them from investing in sustainable practices (See section 3.2 on social conditions in the ER-P area, which discusses the widespread poverty, lack of economic opportunity, and reliance on tavy for basic subsistence).

Then the important role of some urban "elites" in marketing agricultural / forestry / mining products from unsustainable farming is also a factor.

Three types of markets are known to foster deforestation and degradation in the ER-P area:

³² Aubert, S., Razafiarison, S., & Bertrand, A. (Eds.). (2003). *Déforestation et systèmes agraires à Madagascar : les dynamiques des tavy sur la côte orientale*. Editions Quae.

³³ Brooks, C. P., Holmes, C., Kramer, K., Barnett, B., & Keitt, T. H. (2009). The role of demography and markets in determining deforestation rates near Ranomafana National Park, Madagascar. *PloS one*, 4(6), e5783.

- 1) Agricultural products dedicated to export of which market growth, marketing and prices can substantially fluctuate. A moderate incentive for deforestation can therefore be attributed to this economic driver when prices fluctuate significantly and incite farmers to increase their productivity either through unsustainable practices or by agricultural expansion at the expense of forests. For example, permanent crops such as vanilla, cloves and coffee, even under agroforestry systems, can contribute to deforestation and degradation depending on the fluctuation of the purchase price. The ER-P takes this into consideration;
- 2) Precious wood;
- 3) Mining and rare earth products.

Technologic factors

Agricultural intensification practices are currently too rare to play a role in reducing deforestation. Meanwhile, the productivity of traditional agriculture systems (tavy) is stagnating or even declining and intensification practices are not widely observed. Thus, it can be considered that the lack of technological advances in the agricultural sector contributes to deforestation in all areas of the ER-P. There are a few limited exceptions, which include the improved management of post-tavy fallows in the Alaotra-Mangoro region, but only in selected areas. In general, agricultural practices have changed little over the past decades: no motorization, little mechanization, no use of chemical inputs, improved seeds, or innovative water or soil management techniques. Populations rely on slash-and-burn to increase fertility of soils with low presence of weeds, which can be cultivated with minimum tillage. In the Analanjirifo, Sava, and Southern Alaotra-Mangoro regions and to a lesser extent the Atsinanana region, the reliance on non-plowed and non-tilled parcels may translate into a strong influence of tavy on deforestation.

In the timber market, yields are also low at all levels of the value chain (harvesting, processing, charring and combustion). The technologies are not very efficient but relatively homogeneous over the territory. These low-efficiency timber processes foster forest degradation throughout the ER-P.

Policies and Institutional Factors

Limited human and financial resources, the absence of a formalized arrangement for management between NGOs who work intensively in forest areas, and Madagascar National Parks, corruption, conflicts of interest, and the difficult implementation of the system for granting tender-based logging permits all contribute to weak forest governance, particularly at local levels. Due largely to limited provision of services to local populations, a combination of formal laws and traditional community rules are used to manage local resources. A lack of intersectoral coherence of policies or lack of enforcement of policies and the existence of informal legal pluralism are also drivers of deforestation and forest degradation.

Of particular relevance to the local management of forest resources is the lack of coherence between the promotion of Protected Areas (PAs) and the transfers of natural resource management to local populations (TGRN by its acronym in French), delays in the publication of implementing texts, and weak deployment of forest management plans are also important drivers. TGRNs and the role played by grassroots

communities (COBA or VOI in Madagascar) in these TGRNs are generally known and appreciated. Although in some instances these arrangements result in some conflicts of interest due to the ownership or stake of some VOI officials over logging and local resources, they generally accepted as positive management systems.

Some successes have been demonstrated in reconciling conflicting sectoral policies and the impacts on forest resources, such as the resolution of mining / forests conflicts, the reduction of deforestation through PAs and the prohibition of bushfires and tavy, however the literature is widely divergent on the level of success to date. Some analyses, such as that carried out as part of the PERR-FH project, have shown that deforestation has been limited by certain PAs and TGRN contracts, even if the districts where there are the highest number of PA and TGRN are the most deforested. Two assumptions may explain these findings:

(i) It is possible that these areas only shift deforestation elsewhere within the District.

(ii) It is likely that PA and TGRN contracts have been preferentially developed in Districts with a strong need for planning for the management and conservation of natural resources, i.e. in Districts with high deforestation rates. Thus, deforestation may not be less significant in the Districts with PAs and / or TGRN than in the others, but it may be less significant than it would be without PAs and TGRN.

Property and land tenure legislation

In the eastern humid forest ecoregion, traditional land tenure systems have undergone major changes over the last decade. The loss of power of village and traditional leaders, the rise of land transactions, the creation of local tenure offices (BIF) and the introduction of land certificates have altered the traditional land tenure systems. Customary tenure rules that often do not apply to forests now coexists with the current state law.

The effects of these changes are diverse in terms of their impact on deforestation and forest degradation. They can be accelerators (e.g. development of land transactions and incentives for land grabbing for future speculation) or mitigating factors (e.g. certificates which secure tenure for farmers and encourage them to invest in the long-term management of soil fertility) of deforestation and degradation. The poorest households and migrants tend to employ strategies of agricultural colonization through deforestation in order to secure land. This is an important underlying driver of deforestation and the lack of recognition of a forest land tenure regime exacerbates the situation.

In some cases, government attempts to resolve land tenure problems have not achieved its goals. Land security along the borders of protected areas has sometimes encouraged agricultural colonization when incoherent with traditional land tenure systems or the concession of management rights to communities has not improved natural resources management due to the lack of knowledge of ecosystems and effective management practices. In some areas, customary rules are strong and limit land conflicts. In those areas where these rules have fallen into disuse, such as in the Bezanozano area in the Alaotra-Mangoro Region, for example, land conflicts are frequent and there is a race to claim land through *tavy*. Spatial analysis confirms that there is no linear link between land security through titling and the reduction of deforestation.

Culture

There is some evidence that rural populations perceive the forest primarily as a reserve of arable land or pasture (from field surveys and consultations of Salva Terra, 2017). However, further surveys indicate that most households are aware of the benefits of reducing deforestation (for water supply to rice fields, availability of wood resources, and maintenance of capital for future generations and even to fight against climate change). If intact or relatively intact forests are deforested, it seems that this is sometimes done "reluctantly," even though individual behavior can sometimes explain deforestation (no respect for protected areas, resistance to change, individualistic attitude) (Salva Terra, 2017). Discontent with local or central governments may also have some explanatory power for the starting of fires. Competition over land between ethnic groups linked with migratory phenomena explains some races for land clearing.

Finally, sacred forests and taboos provide protection to forests, but the concerned areas are too small to have a tangible impact and immigrants may be less prone to heed the established local belief systems.

Environmental Suitability

The localization of deforestation is correlated with several physical variables:

- Altitude: estimates of the most affected areas by deforestation among eastern rainforests vary between 400 and 1,000 m, mostly because the majority of low land forest has already disappeared (Salva Terra 2017);
- Slope: local communities practice tavy on slopes less than 40°;
- Soil fertility: although fertile soils are deforested first, the expansion of the frontier region is slower;
- Forest fragmentation: isolated forest patches are most likely to be deforested.

The areas that farmers target can be described in descending order of priority (high priority first) the plains or shallows, valleys and then hills for cultivation for ease and productivity. The criteria for choosing the land to be cleared are in descending order the soil fertility, the absence of weeds and the presence of water (Salva Terra 2017).

Summary

Combining the findings of the driver analyses, Figure 5 summarizes the direct and indirect causes of deforestation, and Table 3 identifies the main agents/actors per category of drivers.

In the context of Madagascar, to reliably prioritize and quantify the impacts of each driver of deforestation and degradation in the entire program area has not been feasible with the available data and the plurality of drivers, each of which being difficult to spatialize and map. It is however clear that all drivers are linked or exacerbated by poverty.

Where the causes are currently well known, and identified, it remains difficult to determine their spatial representation with certainty. Deeper consultations and assessment at the commune-level should reveal, at the appropriate level of detail, more information on specific drivers. The ER-P must therefore be flexible in the planning of the activities to be implemented and design them based on the input of local actors who are familiar with the issues in their territory and can validate the choice of priority activities and their areas of implementation. Institutional arrangement for planning and implementation of activities have been designed in this way (see section 6 and 15).

Figure 9: Direct and indirect causes for deforestation (and degradation)

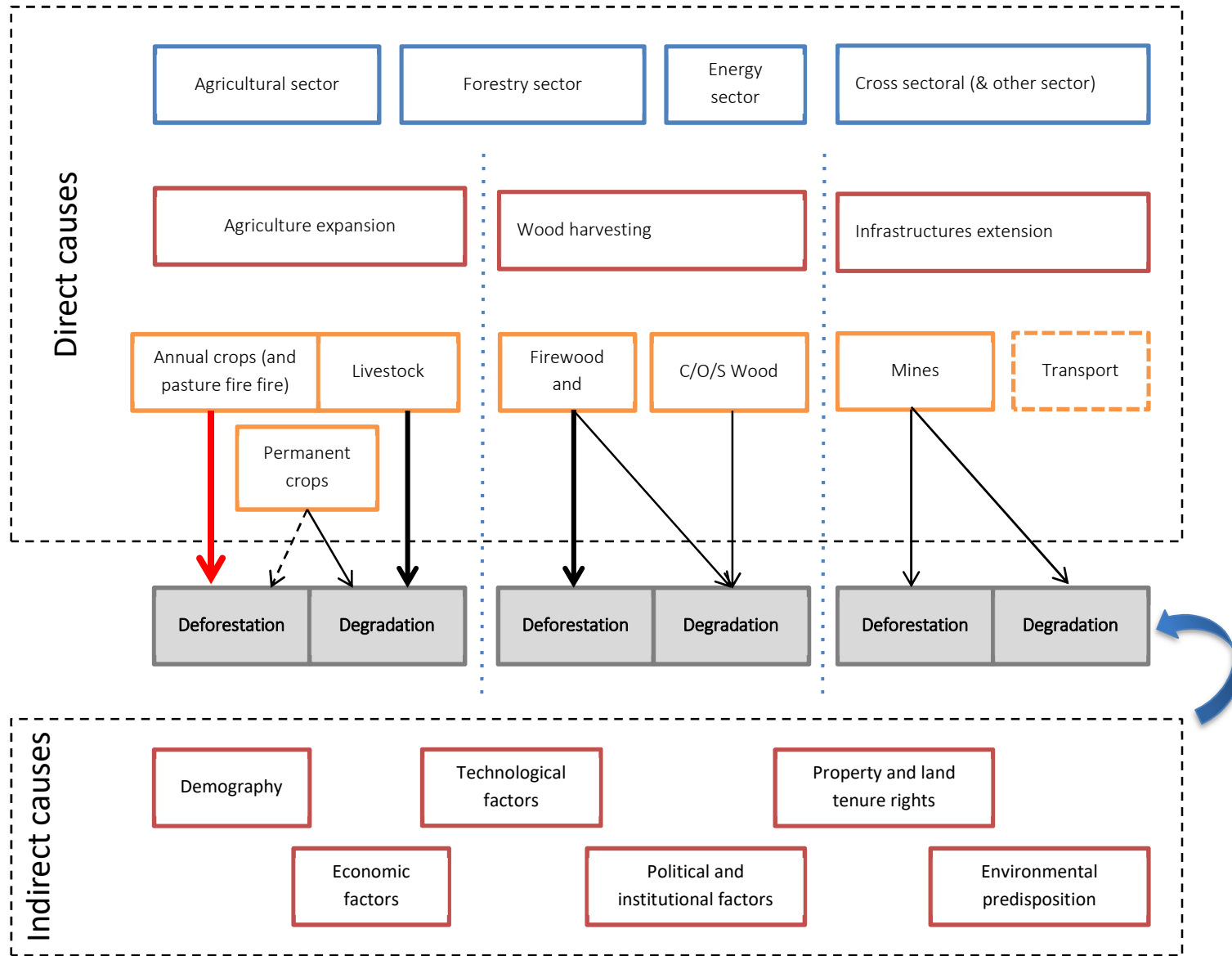


Table 3: Agents, impacts and location of deforestation per main drivers

	<u>Agriculture expansion</u>			<u>Wood harvesting</u>		<u>Infrastructures extension</u>
	Annual crops	Permanent crops	Livestock and pasture fire	C/O/S wood	Fire wood and charcoal	Mines
Agents	All type of farmers	All type of farmers	Farmer with cattle	Artisanal or illegal loggers Households	Households and coal merchants	Artisanal miners
Impacts in terms of deforestation	Most important driver of deforestation	During a first phase farmers could deforest in order to implement permanent crops, but in a second step, most of permanent crops are produce under agroforestry systems and could participate to carbon stock enhancement. Sometimes permaments crops are directly implement on fallow lands of secondary forests.	Impacts can be quite important when pasture fire can burn degraded or secondary forest (and forest fallows)	Low impact	Moyen	Low in terms of deforested area in the reference period, but it could be more important in the near future due to an increase in mining activities and migration effects it creates
Main impacted areas within the program	Everywhere in the accounting area	More importantly in the North East of the accounting area: from Maroanstetra to Manakara for clove production, within a coastal belt of about 50km, and from Antalaha to Mananara for Vanilla production, also within a coastal belt of 50 km.	Within Alaotra Mangoro region mostly	Everywhere in the accounting area		In the near futur some risks exist in the CAZ area and other protected areas.

c. Policies and other activities already in place in the program area that could contribute to conservation and to the enhancement of carbon stocks

Existing Policies and Activities in the ER-P Area

Various projects and activities in the ER-P area contribute to conservation and to the enhancement of carbon stocks. As previously described, one of the criteria for defining the ER-P area was precisely the inclusion of these existing projects. It was deemed essential for the ER-P to build on these initiatives, contribute to their sustainability or even increase their scale of implementation to lay a strong foundation for scaling-up and for the performance of the ER-P as a whole. The ongoing success of these projects and their presence within the ER-P area is a key advantage of the ER-P design (see Figure 6 and Figure 7 in section 3.2).

Ankeniheny-Zahamena Corridor (CAZ)

The Ankeniheny-Zahamena Corridor (CAZ) has long been regarded as one of Madagascar's top conservation priorities and numerous studies have catalogued its rich biodiversity. In order to reduce deforestation in CAZ, the Government of Madagascar and Conservation International developed an avoided deforestation carbon pilot project that provides direct incentives and alternative livelihood activities for communities living around the forest corridor. The CAZ REDD project covers 370,032 hectares of Madagascar's eastern humid rainforest and provides important ecosystem services to both the surrounding area and greater region.

Through the creation and management of the CAZ protected area, the project has resulted in reduced emissions from deforestation and generated Voluntary Carbon Units (VCUs). Revenues from the sale of these VCUs will be reinvested in the project, to reinforce the long-term management of the protected area and to expand economic opportunities for local communities. The reinvested carbon revenues provide a sustainable funding mechanism for conservation activities, and form an essential part of the maintenance strategy for the Protected Area (PA). The PA at CAZ has been developed based on a pioneering model for Madagascar that involves strong collaborative management (co-management) with local communities.

Makira REDD Pilot Project

The Wildlife Conservation Society (WCS) is the delegated manager for the Category II Makira Natural Park, which covers over 372,000 ha and which is surrounded by a 'green belt' or buffer zone of an additional 350,000ha. Makira is a REDD+ project selling carbon credits on the voluntary market. Between 2005 and 2013 Makira has avoided over 1.73 million tons of greenhouse gas emissions reductions, which have been independently monitored, reported and verified using global best-practice methodologies; if this protection is maintained, Makira is also expected to achieve further emission reductions at a similar or larger scale over the coming years.

Working with local communities is the hallmark of this project, and WCS carries out a range of control and surveillance and ecological restoration activities to reduce deforestation in the protected area. Using

carbon and non-carbon revenues, the project supports 120 villages in a range of community development actions including natural resources governance through community based natural resource management, improved subsistence livelihoods (rice and small-scale livestock), conservation enterprises (cloves, cacao and raffia), and health and education. 48,000 people live in the green belt. With the support of WCS they are organised into community associations that each have a management transfer contract with the designated administrator for a specific area of community forest in the green belt. These COBAs simultaneously represent the main threat and the solution to deforestation in Makira and as such are the entry point for all WCS's livelihoods work. By working with WCS, they receive 50 percent of net carbon revenues generated by the protected area.

Madagascar National Parks

Madagascar National Parks (MNP), an association under private law, is mandated by the Malagasy government to manage a national network of 43 protected areas (PAs) with a cumulative area of 2.8 million hectares (comprising one-third of all PAs of the country, and almost 5 percent of the national territory). Moreover, the park network managed by MNP represents all the ecoregions of Madagascar. The objective of MNP is to conserve and sustainably manage the national parks and reserves of Madagascar. These Protected Areas will: (i) leverage climate change mitigation and adaptation through economic incentives for conservation among local populations; (ii) attract investment (donors, private, technical assistance-NGOs) for sustainable development in the region of implementation and; (iii) ensure sustainable management by strengthening professionalization at all levels of management.

The activities carried out by MNP have contributed to lowering the rate of deforestation in the protected area network relative to the average recorded throughout the country. The existence of the network makes it possible to mitigate the effects of climate change and propose solutions for adaptation. The protected areas network is also a proven and indispensable tool for the preservation of some of the essential environmental services for the benefit of the population, helping to improve their resilience and to reduce the vulnerability of their livelihoods.

Conservation activities carried out by MNP are supported by several technical and financial partners. This includes a trust fund, the Foundation for the Protected Areas and Biodiversity of Madagascar, at national level, and KfW at international level for some PAs within the ER-P area. Specifically, within the ER-P area, MNP manages 4 national parks, 3 special reserves and 1 integral natural reserve for a total area of 279,612 hectares. These 8 protected areas belong to the ecoregions of the East, the Center and the High Mountains of Madagascar.

Complexe d'Aires Protégées Ambohimirahavavy Marivorahona (CAPAM)

The CAPAM area is composed of several protected areas all with the same objective: protecting the environment and landscape while contributing to sustainable development. Within the ER-P, part of the CAPAM is managed by MNP, and another part is managed by WWF under *the Programme Holistique de Conservation des Forêts* (PHCF). Funded entirely by Air France, the first phase of Holistic Conservation Program for Forests began in October 2008 and was completed in December 2012. A second phase is under way and will be completed in October 2017. The first pilot phase included 5 intervention sites

(515,000 ha) of humid and spiny forests; currently HCPF sites will comprise 300,000 hectares within the ER-P area in the COMATSA (Corridor Marojejy-Anjanaharibe Tsaratanana) site.

The activities within the ER-P to reduce deforestation and forest degradation revolve around the creation of two New Protected Areas and fifty Natural Resource Management Transfers (TGRN). In parallel, the HCPF is reinforcing its support for developing alternatives to shifting cultivation (tavy), by increasing rice yields, supporting income-generating activities and diversifying of crops (such as market gardening, poultry farming, beekeeping, cash crops, etc.). With multiple research initiatives, the potential for reducing emissions from deforestation was estimated at 35 MtCO_{2e} by 2030 for the 5 sites, (but only COMATSA is included in the ER-P). For the same period, the potential for increasing forest carbon stocks has been estimated at 2.57 MtCO_{2e}.

Missouri Botanical Garden (MBG)

MBG's Madagascar Program program focuses on taxonomic research, botanical exploration, in-country capacity building - with special emphasis on training and disseminating botanical information, and community-based conservation at Priority Areas for Plant Conservation (PAPCs). The organisation is now promoting conservation at 12 PAPCs, which are distributed throughout the country in diverse vegetation types, which have a total area of 95,225 ha.

One of these sites is the Pointe à Larrée Special Reserve, that is within the program zone. This reserve includes one of the last large remaining fragments of Malagasy littoral forest (humid forest on white sand) as well as areas of very rare swamp forest. The management plan for this site is focused on diminishing the threats to this forest that include illegal and non-sustainable exploitation of timber, wild fires, shifting cultivation and charcoal production. Activities include reforestation using fast growing alien trees to provide alternative sources of timber and fuel wood; restoration of critically degraded forest by propagating and planting seedlings of native trees; and poverty reduction in the local community by promoting fishing, handicrafts, small livestock rearing, and improved agricultural techniques. In 2017, a major vanilla growing project - a collaboration between the NGOs Livelihoods, Fanamby and MBG - will be launched in the degraded landscapes surrounding the reserve using an approach that will include planting tree saplings to support the vanilla liana. It is expected that this project will significantly increase the cover of woody vegetation over several hundred hectares.

This management system, even if applied over a small area, is a good example of what the program is aiming at doing by associating conservation and local development. The inclusion of such area is fundamental to build additional similar REDD+ projects in the jurisdiction and scale up such positive experiences.

Sustainable Agriculture through a Landscape Approach (PADAP)

The US\$ 107 million PADAP project has recently been approved by development partners (the World Bank, the French Agency for Development and the Global Environment Facility). The project is managed and implemented by the Government of Madagascar jointly through its ministries in charge of Agriculture, Environment and Water. It is based on an integrated landscape management approach that aims to promote economic value chains (agriculture, forestry, livestock, ecotourism) while preserving the needed essential ecosystem services to support these activities. The project complements the ER-P as 4 of the 5

PADAP landscapes are included in the ER-P area, and its development has been carried out in close collaboration with that of the ER-P. The activities and expected outcomes of PADAP will contribute to the achievement of ER-P objectives. Paramount to the approach of the ER-P is the collaboration between sector ministries to develop a robust approach that emphasizes local development and conservation

Policy and activity outside the ER-P area which affect land use and carbon stock in the jurisdiction.

As described in section 3.3. Political Commitment, the new POLFOR and the RPF National Strategy will contribute to the conservation and improvement of carbon stocks.

4.2. ASSESSMENT OF THE MAJOR BARRIERS TO REDD+

Poverty and precariousness of households' livelihoods

Poverty and insecurity of livelihoods (mainly in rural households) are a major problem; much of the population does not have access to new economic or better-paying opportunities. Poverty can prevent implementation of activities to address the drivers of deforestation and degradation — especially improved agricultural practices — that require significant up-front investment at the household level. While REDD+ cannot solve structural poverty problems, it can give local people access to transformational economic opportunities through REDD+ levers such as initial investments and then carbon revenues.

Poor management of land

i. Lack of regional zoning

Slash and burn farming and vast areas of fallow land stem from a lack of spatial zoning to manage the interface between forests and agricultural areas. The absence of a consensus among government and smallholders on the distribution of land for different uses, and a lack of zoning for such uses means that conflicts related to use remain an ongoing risk. Conflicts over encroachment between the different sectors are not new; the most famous for forests is the overlap of mining sites and forests. As noted in the drivers section, the current growth of the informal mining sector represents a real future threat to the implementation of REDD+ because of population migration to the mine and then require natural resources for their subsistence. The development of this sector requires strict regulation and zoning. Clear instructions must be given on the methodology to handle and resolve overlapping of uses in an area, especially in the event of chaotic “mineral rushes.”

ii. Uncertainty about forest management objectives outside PAs and New Protected Areas (NPAs)

Uncertainties about the purpose of forests (see next paragraph) are an additional component of the zoning problem which concerns the entire national, regional or communal territory. From the legal standpoint, only forests in PAs and NPAs appear to have a 'secure' spatial and temporal management objective, namely conservation. For other forested areas — specifically the national forest estate and the state forests — uncertainties remain regarding their purpose, or even their legal status. Even conservation

focused community associations (COBAs) may request to harvest part of the forest under their management in the event of an extension of their contract after the first 3 probationary years and an old classified forest may be decommissioned for tender-based logging.

Uncertainties are exacerbated by the absence of formal forest zoning (see previous paragraph). From a REDD+ perspective, such uncertainties create severe implementation challenges: there must be coherence, internal to the forestry administration and external to its partners (local, national or international) on the one hand, and sufficiently refined forest zoning to define forest management areas with specific objectives (conservation, sustainable management, or restoration). REDD+ must also work to remove this barrier by clarifying the purpose of forest fallows and the situation of the "koloala", traditional systems of maintaining forests, which are important and prerequisite issues for bringing zoning and forest management objectives together.

Poor governance and failure of national policies

The low frequency of enforcement of national policies over the last 15 years has led to insecurity in the rural sector in terms of resource management, the right to land and the support to be provided by the administrative entities at the state at regional levels, as part of decentralization. It will be necessary to consider alternative models which in order to increase the chances of success.

The non-continuity of public entities and the lack of a database

Forest governance structures remain poorly adapted to the situation on the ground, and largely unable to respond in real time. They are not able to manage the current forest areas, in terms of adequate numbers of personnel, logistics or staff capacity. Various state sectors are affected by a chronic shortage of staff to carry out their respective tasks. The forest administration is not the only one to be affected by this phenomenon and the shortage of staff is a major gap if the various public services are to be involved in a sustainable and intersectoral REDD+ approach. The lack of equipment and databases within local entities or local administrations and even sometimes at regional level, is a limiting factor because information and partnerships can be lost during service handovers.

Low efficiency of decentralization of powers and resources

A key issue related to the ineffective implementation of the strategy of transferring management from forest administration to community is the inadequate preparation of the local communities and the lack of monitoring and support once the process has begun. The measures taken in the context of the decentralization of forest resource management are not commensurate with the expected results. COBAs, fokontany (local communities in the Malagasy term) and municipalities often lack information and effective powers to carry out their role as custodians of forest resources. The strengthening of local institutions to be promoted by REDD+ will have to go hand in hand with the strengthening of forest governance from the higher levels of public service.

Institutional constraints and lack of an intersectoral approach

The institutional and governance framework in Madagascar currently remains disparate among sectors. Although several intersectoral monitoring or collaboration committees exist, they have a limited impact in terms of implementation. Moreover, the strong competition between the regional directorates for access to finance prevents the establishment of a real collaborative dialogue and the formulation of a common framework for the implementation of the different policies. National preparation for REDD+ has already led to a change in its intersectoral nature, particularly through the REDD+ National Platform and the Regional Platforms that have already proved effective in the development of an implementation framework (See section 6). However, this intersectoral approach must also be expressed at the local level and REDD+ activities must therefore succeed in removing this barrier. The ongoing REDD+ readiness activities are actively seeking to improve capacity at local levels in the ER-P area.

Problem of land security (see section 4.4 and 4.5)

State recognition of forest land such as fallow land or forest requires the presence of the forest administration according to existing law. However, the forest administration is not always called upon to participate when the land tenure department issues titles for cleared land. In addition, forest fallow areas are at the center of conflicting perceptions among the two sectors concerned, namely the forest sector and the land sector. While the local tenure office (BIF) can provide land certificates for agricultural purposes on any forest fallows as long as they are outside a PA, the forest administration is reluctant to permit the agricultural clearing of these woody fallow lands and would prefer them to be dedicated to forest restoration. Thus, the purpose of woody fallow land is not clarified and so, when there is a lack of agricultural land these forest fallows provide an alternative for agricultural practices in many localities, while they could constitute areas dedicated to forest restoration (and carbon stock enhancement).

The absence of an incentive system for agricultural development and changing practices

There is a significant lack of incentive systems to attract adequate investments for agricultural development and alternative energies, especially among local populations. Sector policies must be at the forefront of the transformation of the practices of local populations to ensure both the development objectives and the protection of natural resources as well as a mobilization of resources to implement the strategies and activities. Madagascar has received considerable support in recent decades for green development projects (such as the different Environmental Plan PE2 and PE3), yet these efforts have failed to meet the expected targets and reduce deforestation. Communities still lack financial support and incentives to invest in improved and alternative farming practices, while they are responsible for most of the deforestation, often due to extreme poverty. To date, there is a lack of incentive and intersectoral policies to develop and catalyze national capacities rather than to solely depend on donors and other external actors.

4.3. DESCRIPTION AND JUSTIFICATION OF THE PLANNED ACTIONS AND INTERVENTIONS UNDER THE ER PROGRAM THAT WILL LEAD TO EMISSION REDUCTIONS AND/OR REMOVALS

a. *Vision and approach for the development of ER-P*

Vision of the ER-P

Considering the wide range of drivers and agents of deforestation occurring in the area, the ER-P aims to be flexible and ensure that orientations and selected activities actually address the pressures that forests are subject to, in a specific and effective way. In other words, the list of activities to be implemented needs to be broad enough to encompass all local specificities. The National REDD+ Strategy is being developed and the activities laid out in the ER-P are organized as interventions with direct and indirect impacts in terms of reduction of deforestation and forest degradation. As described in section 2.1, the National REDD+ Strategy and the ER-P developments have not been done in parallel and inclusively. The ER-P design provided a concrete basis on which to shape and guide the National REDD+ strategy. Concurrently, the National REDD+ Strategy a solid rationale and analysis of indirect causes of deforestation (not only specific to Eastern Humid Forest and the ER-P) as well as ensuring the political involvement and commitment for framing the ER-P. Thus, the contents of the ER-PD are directly linked and totally coherent with the National REDD+ Strategy, at least for the Eastern Humid Forest (other ecoregions have specificities in terms of drivers of deforestation that this ER-PD is not addressing).

Implementation within the ER-P intervention area will follow a landscape approach aiming to address the direct and indirect causes of deforestation and degradation within primary watersheds (of significant size: >100,000Ha to meet the definition of a "landscape") representative of entire landscapes, as delineated by primary ridgelines, and allowing for assessing situations along value chains (or the transition to another ecozone, where applicable). This landscape-based approach is critical for clearly establishing the link between stakeholders located upstream and downstream within a landscape and clarifying causal relations within the targeted area.

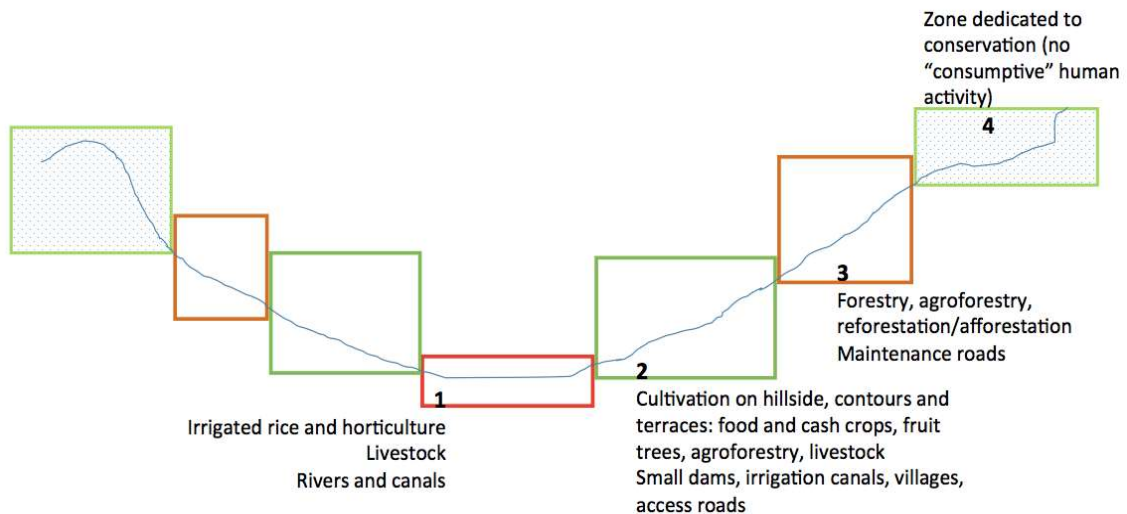
Although realities will sometimes differ from location to location, this landscape approach provides an opportunity for the identification of specific intervention areas at watershed scale that could be used as a general framework:

- Zone 1 or low-lying lands where the gradient is equal or under 3%. This zone is considered suitable for agricultural developments, as well as agroforestry. Most of the time, it is also already used for farming purposes.
- Zone 2, or "mid and lower slope" where the gradient <15%, considered suitable for terraced or contour agricultural developments and conducive for developing agricultural potential. This zone is also considered suitable for agroforestry and private, communal, or industrial reforestation.
- Zone 3, or "midslope" characterized by a gradient >15%, considered suitable for conservation and forest stock rehabilitation, or reforestation and erosion control activities. Where the gradient is

favorable (<45%), this zone is also considered suitable for agroforestry and private, communal, or industrial reforestation.

- Zone 4, or "ridge zone", considered suitable for conservation and forest stock restoration, or reforestation and erosion control activities;

Figure 10 – Identification of zones for an integrated watershed management approach within the ER-P area



Transformative effect and evolutionary approach

The ER-P is intended to be **transformative**, i.e. it aims to enable:

- Improving governance and decision-making through institutional arrangements designed to facilitate the development of activity and investment plans that match regional and local specificities and whose political validation will be decided by stakeholders from all levels;
- Improving land planning and use at commune level, through the development and implementation of land use plans at the commune and regional levels (SAC and SAR respectively);
- Providing communities and the private sector with incentives to support sustainable development and improve their management of agricultural and raw materials (coal, perennial and annual crops, etc);
- Supporting and improving the management of land and land use-related conflicts through community and participatory mapping of activities during activity planning.

The ER-P is designed with the intention that it will *evolve and expand* (see section 6 and 15 for more clarifications):

- It will take more than the first years to achieve deforestation reduction across the considered area. The direct and rapid impact activities currently planned through initial investments cover only part of the considered zone. It will take months or even years for most activities with impacts that are indirect but key over the long term, to yield tangible results in terms of emission reductions. However, the ER-P has the aim to properly balance the two types of activities to ensure short- and long-term profitability that allow not only the maintenance of activities set up initially, but also the aim to reinvest in new activities and new zones.
- The integrated watershed approach leaves ample room for adjusting management as needed. In line with national development plans, this approach includes a portfolio of development opportunities throughout the ER-P implementation zone to stakeholders (government, donors, private sector, NGO, etc.). The availability of resources will dictate where to start and develop and the ability to attract new investment will dictate how rapidly activities can be expanded. Some watersheds may also be prioritized over others for strategic purposes (e.g. new investment from the private sector) or according to the availability of means within the different relevant administrations. The flexibility of this approach provides an opportunity for implementing according to the possibilities secured and capacity available at each stage. This approach also allows for achieving enhanced consistency in implementation and increasing the capacity according to the results obtained during the monitoring of performance indicators, while providing stakeholders with intervention opportunities matching different budget levels.

Although the strategic options proposed in the evolving National REDD+ Strategy are not sector-specific but crosscutting, the ER-P proposes to group activities per sector, essentially to make them more understandable to those in charge of implementation. Each type of activity is set forth in the following table accordingly. It must be noted that these types of activities will be individually described in a more detailed manner in the next tables but also during implementation, with details of the different operations and interventions they involve within the specific contexts of their application. It should also be noted that the types of activities will not all be implemented through initial investments but are the solutions deemed appropriate to address the identified causes of deforestation and degradation (cf. section 4.1) which may (and should) be implemented during the carbon income reinvestment phases, as well as through the additional investments and funding (from private operators and/or donors) that the ER-P will continue to attract throughout its lifespan.

Table 4: Types of activities of the program

Category of activity	With direct impacts	With indirect impacts
Agricultural sector	<p>AD 1 - Optimize production systems and agricultural and livestock-dedicated infrastructures</p> <p>AD 2 - Improve the management of cash crop production under the agroforestry system and improve the food security of local communities' riparian to forests</p>	<p>AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at the local level</p>
Forest sector	<p>FD 1 - Improve the management of forest areas under the landscape approach</p> <p>FD 2 - Promote private and community reforestation, rehabilitate degraded forest areas, and reforest in consideration of local needs, without converting natural forests</p>	<p>FI 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire management</p> <p>FI 2 - Improve the contribution of the forest sector to economic development by promoting the use of non-wood products and other subsectors that do not affect the carbon stock</p>
Energy sector	<p>ED 1 - Promote improved fuel wood transformation and use techniques, as well as the dissemination of improved coal stoves in urban centers</p> <p>ED 2 - Develop the use of renewable energy (solar, biogas, etc.) for domestic use</p>	<p>EI 1 - Support the harmonization and development of the legal framework relating to the development of alternatives to fuel wood and sustainable fuel wood supply</p>
Crosscutting and other sectors	<p>ID 1 - Enhance the benefits delivered by the conservation of biodiversity and ecosystem services</p>	<p>II 1 - Reinforce land security, including with reforestation actors</p> <p>II 2 - Improve the coordination and monitoring of mining and agricultural developments and ensure the setting up of compensatory reforestation</p> <p>II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level</p> <p>II 4 - Align the legal framework with the institutional one conducive to the good governance of the REDD+ mechanism</p>

The table hereunder describes the main direct and indirect causes of deforestation and degradation that each type of activity is intended to address and solve in priority.

Table 5: Link between the types of activities and causes of deforestation

		AGRICULTURAL EXPANSION			LOGGING				EXTENSION OF INFRASTRUCTURES		UNDERLYING CAUSES				
		Annual crops	Perennial crops	Livestock and pasture fires	Commercial logging	Fire wood	Timber	Coal	Hauling	Mining activities	Population growth	Economic factors	Technological factors	Political and institutional factors	Ownership and land right
Agricultural sector	AD 1 - Optimize production systems and agricultural and livestock-dedicated infrastructures	✓		✓								✓			✓
	AD 2 - Improve the food security of and agricultural production management by local communities riparian to the forests		✓							✓		✓			✓
	AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at the local level	✓	✓	✓					✓			✓	✓		
Forest sector	FD 1 - Improve the management of forest areas under the landscape approach				✓	✓	✓	✓	✓				✓	✓	
	FD 2 - Promote private and community reforestation, rehabilitate degraded forest areas, and reforest in consideration of local needs, without converting natural forests					✓		✓		✓				✓	✓
	FD 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire management			✓				✓	✓				✓		
	FI 2 - Improve the contribution of the forest sector to economic development by promoting the use of non-wood products and other subsectors that do not affect the carbon stock											✓	✓		
Energy sector	ED 1 - Promote improved fuel wood transformation and use techniques, as well as the dissemination of improved coal stoves in urban centers					✓		✓		✓		✓			
	ED 2 - Develop the use of renewable energy (solar, biogas, etc.) for domestic use					✓		✓		✓		✓			
	EI 1 - Support the harmonization and development of the legal framework relating to the development of alternatives to fuel wood and sustainable fuel wood supply					✓		✓				✓	✓		
Crosscutting and other sectors	ID 1 - Enhance the benefits delivered by the conservation of biodiversity and ecosystem services									✓	✓		✓		✓
	II 1 - Reinforce land security, including with reforestation actors					✓		✓					✓	✓	
	II 2 - Improve the coordination and monitoring of mining and agricultural developments and ensure the setting up of compensatory reforestation												✓		
	II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	
	II 4 - Align the legal framework with the institutional one conducive to the good governance of the REDD+ mechanism	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	

Concurrently with these activities that directly or indirectly generate ERs, the ER-P will also need to implement activities with social and incentive scope for local populations, taking the form of "rewards" (this term will be used to refer to this type of activity in the rest of the document) and allowing for addressing problems relating to:

- Population growth (family planning, education, etc.);
- Human health and the living conditions of local populations (hospital infrastructure, clinics, markets halls, etc.);
- Education, including environmental education.

b. *Description of activities*

It is important to clarify that these activities have been identified and prioritized through the consultation of stakeholders, mostly the PFN REDD+ and the PFR REDD+. Specific workshops were organized in order to first list all potential activities that could contribute to deforestation within the ER-P (and according to the analysis of the drivers described in section 4.1) and then to prioritize (by ranking) these activities in terms of ERs impacts and the category of impact (direct, indirect, long-term, short-term). On September 7, 2017, a specific one-day workshop was organized with the PFN REDD+ and 3 representatives of each regions of the ER-P (Chief of Region, director of DREEF, and one representative of VOI) to conduct participatory mapping and identify for each region: (i) the main driver(s) of deforestation, and (ii) a spatialization of REDD+ priority activities during the ERPA. A summary of this work is presented in ANNEX 1. These maps will further be refined with the PFR REDD+ in the coming weeks September and will inform the regional REDD+ strategy and priorities of implementation within the program. This will lead to a spatially explicit set of activities over the next 5 years, and on a longer time horizon. Also, in order to pursue the development and improvement of the ER-P design, BNC REDD+ will intensively work with each main sectoral ministry (Ministry of Agriculture, Ministry of Land Use Planning, Ministry of Energy, Ministry of Water, Ministry in charge of Mining) including technical as well as political representatives. This key step will focus on defining specific action plans and partnerships to ensure efficient future implementation of these activities within the program, and ensuring coherence with potential programs or projects these ministries are coordinating. More details and practical elements will be added to each of the activities presented below.

As described in section 6.1 and 15.1, these activities will be implemented through "REDD+ projects" at three different scales: communal, intercommunal/landscape, pluri-regional ("large-scale projects). The decision and implementation process mixes a top-down approach (each region will develop a Regional REDD+ Strategy that serves as a regional framework with a prioritization of activities and areas for implementation) and a bottom-up approach: the design and proposal of concrete REDD+ projects to be implemented will be realized at local level with the participation of all stakeholders of the concerned territory scale (for communal or intercommunal/landscape projects). According to available funding at regional level, all REDD+ projects will be prioritized using performance criteria (see section 15.1) and implemented as planned in the project proposition. Executing agents are not predefined for each activity

and can be diverse or even include several agents for one REDD+ project. The description of activities here below tries to identify the most likely agents or partners in charge of the implementation but does not aim at constraining the further design of REDD+ projects that will contain maybe only one type of activities described here, or a mix of them, according to local deforestation drivers and issues to tackle.

Agricultural sector

The strategy adopted for activities within the agricultural sector aims to tackle the main issues that are directly or indirectly forcing slash and burn agriculture:

- *High levels of poverty (especially rural)*: The poverty of most rural populations prevents them from investing in more sustainable practices and better equipment, and hinders risk-taking related to changes in agricultural practices. Activities AD1 and AD2 will allow local farmers and populations to increase their revenues and access new, more productive and sustainable practices and technologies.
- *Land tenure*: Lack of secure land tenure leads to extensive agricultural practices to claim land through use. Activities AD1 and AI1 will create “non-land” jobs, decreasing the dependency of local population on land tenure (e.g. promotion of extension services and technical units in close proximity to communities, cooperatives management, transformation units, etc.) .
- *Increased need for food production*: Madagascar is characterized by rapid population growth. This increase in population has resulted in an increased demand for food products, which results in increased slash and burn agriculture (increased need for land and acreage) and/or the reduction of fallow periods. Activities AD1 and AD2 will directly mitigate this issue by (i) increasing productivity of current agriculture lands, and (ii) diversifying food production. In parallel, activity AI1 will seek to increase the access to markets which will facilitate increased opportunities for rural export of agricultural products.
- *Cattle breeding and related fires*: illegal encroachment leads to illicit burning of forests, often by individuals that are not part of the surrounding communities, and do not adhere to locally established grazing grounds. Activity AD1 will tackle this issue by promoting pasture land management through the development and setting up of collective agreements and simplified development and management plans.

Activities with direct impacts	AD 1 - Optimize current production systems and agricultural and livestock-dedicated infrastructures
Description	<p>As described earlier, agricultural expansion is the main cause of deforestation and livestock farming is a major cause of forest degradation. Since their effects are aggravated by population growth, it is critical to promote optimized production methods to improve the income levels and food security of the populations, while limiting impacts on forests.</p> <p>Special attention will be paid to the following activities:</p> <ul style="list-style-type: none"> ▪ Reinforce extension services and technical units in close proximity to communities that help agricultural producers to access inputs, seeds, and tools, build producer capacities through workshops, as well as field training, and facilitate the use of innovative concepts and technologies that involve lesser costs and are profitable in the short term; ▪ Introduce and promote improved techniques that match the local agro-ecological conditions and are sensitive to changing climate dynamics. Madagascar is increasingly affected by this last problem which causes occasional droughts that severely impact production and drive some producers to clear forests to increase their farmed surface area to ward off risks of harsher, future droughts; ▪ Improve pasture land management through the development and setting up of collective agreements and simplified development and management plans. The ER-P will promote the setting up of improved grazing systems to reduce the impact of cattle on forest edges and prevent grazing in forests.
Location	<p><u>In general:</u> Zones 1 and 2 of watersheds</p> <p><u>Activities planned during the ERPA:</u> Through the PADAP project, the activities will be conducted in three watersheds of the ER-P, namely Andapa, Soanierana Ivongo, and Iazafo. Specifically, the following will be funded: access to improved agricultural technologies and inputs, advice and support to farmers, and the setting up of improved grazing and sustainable management methods to limit fires.</p> <p>Under the ER-P, existing REDD+ protected areas and sub-projects are already contributing and will contribute to improving farming practices in riparian areas in close proximity to forests (buffer zone around the protected areas) with the aim of increasing farmer and household income and reducing their need to use forest resources, as well as covering part of opportunity costs</p>
Results expected over 5 years	<p>5,000 livestock farmers have adopted sustainable livestock farming and grazing methods</p> <p>10,000 farmers have integrated a sustainable agriculture training and support program and have adopted improved agricultural technologies. In 5 watersheds deemed priority, the access to technologies and inputs has been substantially</p>

	improved and the improved agricultural productivity of 10,000 farmers has mitigated impacts in terms of deforestation, while maintaining secondary forests and forest fallows, therefore reinforcing carbon stocks.
Beneficiaries	Livestock farmers, farmers, smallholders Farmers' federations and associations, agricultural cooperatives Extension services and technical units in close proximity to communities
Potential executing agent or partners	NGOs, local associations, STDs, economic operators

Activities with direct impacts	AD 2 - Improve the management of cash crop production under the agroforestry system and improve the food security of local communities' riparian to forests
Description	<p>One of the objectives of the program is to encourage local populations to use agroforestry systems to increase their cash crop production, as an alternative to <i>tavy</i> and an additional source of income, subject to complying with a number of sustainable practices and ensuring that external events do not accelerate deforestation (cf. section 4.1). Setting up new agroforestry areas will prioritize secondary forest formations to generate benefits from the reinforcement of the carbon stock offered by these fallows. Concurrently, the ER-P aims to improve food security by diversifying food crop production. Agroforestry systems will therefore be developed in parallel to improved techniques and diversification of annual food crops, or even livestock (silvopasture), and as a complement to them. Among its key activities, ER-P therefore will:</p> <ul style="list-style-type: none"> ▪ Promote agroforestry approaches where appropriate with cash crops (vanilla, coffee, clove, cocoa); ▪ Support research on the development of agroforestry integrating cash crops (vanilla, coffee, clove, cocoa) in forest areas and involving no negative effect on carbon stocks; ▪ Support village communities to improve the availability of food through food crop production diversification
Location	<p><u>In general:</u> Zone 3 and 2 of watersheds</p> <p><u>Activities planned during the ERPA:</u></p> <p>Under PADAP, the watersheds of Andapa, Soenierana Ivongo, Iazafo, and to a certain extent Bealanana, will benefit from activities to promote the adoption of sustainable agroforestry practices.</p> <p>Existing REDD+ protected areas and sub-projects already contribute and will contribute to improving agroforestry practices (cocoa, vanilla, clove) under ER-P.</p>
Expected results	15,000 ha of sustainable agroforestry system in the ER-P zone, leading to an increase in producer income

Beneficiaries	Small producers who are already agroforestry farmers or farmers wishing to adopt the proposed practices. Farmers' federations and associations, Agricultural cooperatives
Potential executing agent or partners	NGOs, local associations, STDs, economic operators

Activity with indirect impacts	AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at local level
Description	<p>The ER-P is a major opportunity for setting part of the agriculture sector on the path to green development, especially since it offers a major opportunity for mobilizing private investments for agricultural value chains. Agricultural areas are still not farmed to their full potential because national markets are not sufficiently structured and small producers cannot have access to international ones because the local subsector lacks structure and it is difficult to collect large volumes of agricultural products. As such, the objective of the ER-P is to promote the integration of the private sector with the REDD+ mechanism, especially with respect to agricultural production, since the development of crops and increase of income (which go hand in hand with deforestation reduction) cannot sustainably materialize unless organized and professional subsectors are created. Concurrently and as a complement, ER-P will:</p> <ul style="list-style-type: none"> ▪ Promote the creation of small-scale transformation units; ▪ Support small enterprises so they may gain access to transformation technologies; ▪ Set up, structure, and reinforce producers' networks to become partners of the economic operators of the promising value chains linked with REDD+; ▪ Link communities practicing market-oriented production with operators who hold part of the market (market operator and production operator relation - MOPO); ▪ Professionalize local producers and crafts makers so that they develop entrepreneurship, hone their negotiation skills with collectors and transformation and export enterprises, and access financial resources dedicated to entrepreneurs; ▪ Set up one or several reliable and accessible economic information systems (producer networks and market); ▪ Promote bio-prospecting to use natural resources for economic development without causing deforestation or forest degradation; ▪ Promote mechanisms that bestow added value to production, such as certifications (organic, fair trade, sustainable) and labels (green job) ▪ Through the landscape approach, the ER-P will promote the setting up of agricultural investment areas outside of forests and in low-lying areas.

	<p>More tangibly, the ER-P should allow for structuring agribusiness subsectors within the jurisdiction, enabling a number of private operators to invest in these areas with the guarantee of getting a given supply of quality products, and complying with a number of environmental criteria, including deforestation reduction of the forests belonging to the same watershed. A study is launched on the matter, with the aim of developing 3-4 agribusiness projects and creating partnerships with a number of private, national or international operators as well as identifying key opportunities for future development.</p>
Location	<p>Across the ER-P area, but more particularly in zones 2 and 3 of watersheds where the potential productivity will justify the investment and attract investors</p>
Expected results	<p>3-4 agribusiness value chains set up, linking producers and buyers through sound and sustainable value chains and contributing to deforestation reduction. If possible, each of these subsectors has adopted an environmental or social labeling system.</p>
Beneficiaries	<p>Small producers experiencing difficulties to access markets Farmers' federations and associations, Agricultural cooperatives</p>
Potential executing agent or partners	<p>NGOs, local associations, STDs, economic operators</p>

Forest sector

While deforestation is mainly due to the agriculture sector and *tavy*, degradation is largely caused by illegal and artisanal logging. In addition, the GoM has begun to consider the important role of reforestation and so far, the forestry sector has not contributed to forest restoration at scale, or more importantly to supplying local needs of timber and fuel wood. Thus, the global strategy of the ER-P within the forest sector focuses on addressing several barriers:

- *Weak enforcement of laws and regulations:* corruption and political influence of local timber operators makes enforcement of logging permit systems difficult, resulting in illegal and artisanal timber harvesting. Lack of capacity causes lengthy or ineffective processes for management transfers to communities. Activities FI1 and FI2 will increase and improve controls as well as creating economic incentives to produce timber legally both for loggers and communities;
- *Lack of adherence to reduced impact logging practices:* Currently, rotation periods are often not respected. Activity FD1 will ensure that forest management is performed under a specific landscape plan, dedicating some areas to production (including reforestation) and others to conservation;
- *Insufficient timber and wood fuel supply to local and urban population:* FD2 and FI2 will foster partnerships between communities near to the forests and private operators to quantify and supply needs for timber and fuel wood and promote community-based reforestation on degraded forest land or fallow lands.

Activities with direct impacts	FD 1 - Improve the management of forest areas under the landscape approach
Description	<p>The ER-P will need to harmonize all forest sector activities inside the landscapes in consideration of existing PAs and forest massifs and, as such, the activity will focus on the following interventions:</p> <ul style="list-style-type: none"> ▪ Systematize the implementation of master plans and forest development and management plans as part of a sustainable landscape approach (cf. watersheds) and in consideration of NPAs and PAs; ▪ Reinforce the sustainable management of protected areas under SAPM and ensure their proper management. The Program will support the maintenance and development of protected area management by reinforcing or creating community management structures, supporting other livelihoods of neighboring communities (agriculture, energy), and developing strategies aiming to reduce the impact of small-scale mining; ▪ Improve and roll out forest zoning and the KoloAla system of protecting forests according to local needs.
Location	<p><u>In general:</u> Zones 3 and 4 and within existing PAs.</p> <p>Activities planned during the ERPA: all protected areas included in the program (see</p>

	Figure 6) have a management plan that will be implemented during the ERPA.
Expected results	All areas of the ER-P that are implementing all types of REDD+ activities will have forest development and management plans.
Beneficiaries	Loggers, local communities
Partners	Loggers, STDs, economic operators and local communities

Activities with direct impacts	FD 2 - Promote private and community-based reforestation, rehabilitate degraded forest areas, and reforest in consideration of local needs without converting natural forests
Description	<p>In synergy with the Forest Landscape Restoration (RPF) strategy, the ER-P will need to ensure reforestation to achieve several objectives: (i) restore degraded and strongly degraded forest spaces using appropriate (endemic) species, (ii) meet the fuel wood and firewood needs of local populations (cf. ED1 activities), (iii) increase the marketed timber productivity. With this focus, the ER-P will support the following through this activity:</p> <ul style="list-style-type: none"> ▪ Build capacity and reinforce the diversification of reforestation activities with reforestation actors. The program will have to ensure that reforested areas can serve and meet several needs at local level. As such, local actors will receive assistance to identify their needs and be supported in setting up, as well as monitoring local forest planting or restoration areas. Furthermore, the program will ensure that the reforestation activities are conducted concurrently with creation of short-term income-generating activities to ensure the sustainability of planting and restoration areas (hence the ER-P landscape approach); ▪ Improve the sustainable management of forest plantations with the aim of increasing productivity through gradual diversification of the species used and introduction of improved reproduction techniques to reduce gradual degradation; ▪ Restore degraded forests to improve biodiversity connectivity and conservation through the restoration of key areas in the forest corridor; ▪ Develop financial and land incentives to enable the private sector to invest in reforestation and forest restoration.
Location	<u>In general:</u> Zones 3 and 4 of watersheds
Expected results	In 5 years, where demand for timber and fuel wood is lower than supply, specific reforestation areas will have been implemented and should reach local and urban needs.
Beneficiaries	Local communities
Potential executing agent or partners	STDs, economic operators and local communities

Activity with indirect impacts	FI 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire control
Description	<p>Deforestation could be effectively reduced if forest areas benefited from stronger surveillance and monitoring. However, to date, such surveillance and monitoring are not conducted routinely. Various reasons account for this and the ER-P will strive to:</p> <ul style="list-style-type: none"> ▪ Update the manual of texts and procedures for surveillance and monitoring of forest resources, and ensure its dissemination and the training of relevant agents to avoid conflicts of jurisdiction where actors conduct separate interventions, facilitating improved enforcement; ▪ Improve the capacity of the Ministry in charge of Justice, Customs, and Public Security, for implementing the forestry legislation and codes relating to forest management and forest product control (Forestry Code, COAP); ▪ Encourage the development and approval of <i>DINAs</i> on forest resource management (sanctions, etc.) and their monitoring at local level (VNA, KASTI, other actors) or revitalize existing structures; ▪ Develop systems to track wood and non-wood forest products (including mining products extracted from forests) with the forest administration.
Location	<u>In general:</u> Zone 4 mainly
Expected results	STD and local communities will have higher capacity and will prove that the increase in enforcement substantially impacts degradation of forest resources. Improved identification and prosecution of illegal activities within forests by the forest administration as a result of access to better data and a traceability system on forest products.
Beneficiaries	STDs, Local communities
Potential executing agent or partners	STDs, economic operators and local communities

Activity with indirect impacts	FI 2 - Improve the contribution of the forest sector to economic development by promoting the development of non-wood products and other subsectors that do not negatively affect carbon stocks
Description	<p>To encourage local actors and operators into the sustainable management of forests and maintenance of forest cover, the ER-P will need to participate in the development of wood and non-wood forest product-related subsectors and markets, with to the aim of increasing the profitability of sustainable forest resource use and therefore making it more competitive than the conversion of forest areas into agricultural lands. The ER-P will mainly:</p> <ul style="list-style-type: none"> ▪ Develop and facilitate partnerships between communities near the forests, producers, and economic operators, to structure the upstream part of the

	<p>subsectors in such a way as to enable all actors to earn additional income or benefits;</p> <ul style="list-style-type: none"> ▪ Develop sustainable supply strategies; ▪ Quantify local and regional needs in wood to supply households and markets in a sustainable way, as well as encourage loggers with an increase in their income, owing to increased sales and access to markets; ▪ Promote promising subsectors that could contribute to reducing deforestation and degradation and ensure sustainable use of relevant non-wood forest resources with strong added value (such as the subsectors of essential oils, medicinal and ornamental plants, etc.).
Location	All zones, preferably in communes with high forest cover (in general in zone 3 and 4 of watersheds)
Expected results	Sustainable value chains of timber and non-timber products based on partnership with private sector and forest-dependent communities will be created within communes and districts with important forest cover, creating employment, including non-land based jobs.
Beneficiaries	STDs, Local communities
Potential executing agent or partners	STDs, economic operators and local communities

Energy sector

Energy sector activities of the ER-P will aim to address both situational and structural issues:

- *Population growth and growing needs for fuel wood:* ED1 and E11 are dedicated to the improvement of energy efficiency in the overall value chain of wood fuel production and use, as well as creating legal and institutional frameworks necessary to create incentives for producers and consumers;
- *Lack of energy alternatives or efficient technologies:* more efficient fuels are not available or prohibitively expensive or inaccessible in rural areas, and efficient production practices and improved technologies require investments that are not accessible to many poor producers. Activity ED2 will specifically seek to reduce the share of charcoal in the full energy mix by promoting energy alternatives like agrofuels or micro-hydropower and solar systems. Of course, the ER-P will have to attract and create specific partnerships with appropriate investors and private operators in order to accomplish these aims.

Activities with direct impacts	ED 1 - Promote fuel wood produced in sustainable ways and the dissemination of improved coal stoves in urban centers
Description	<p>To ensure sustainable production of charcoal, the ER-P proposes to focus on three key points:</p> <ul style="list-style-type: none"> ▪ The use of improved charcoal making techniques to improve efficiency of production. To pass these improved charcoal making techniques on to charcoal makers, they (or existing associations) should be provided training on (i) the species that should be used in consideration of the Malagasy legislation, the tree's growth, and the quality of the charcoal produced, (ii) the use of the improved charcoal making technique, as well as (iii) the setting up of the production zone, the quota to be produced, and dedicated plantations of trees (in relationship with the FD 2 activity, the ER-P will have to promote tree plantations to divert charcoal practices from natural forests). ▪ The product marketing and tracking system to eliminate illegal charcoal production. The produced charcoal should be grouped and sold at one same place: an "improved" and sustainable charcoal depot and sales points will be set up in charcoal-producing villages. Depending on the networks and types of means currently used to haul charcoal, controls will be reinforced concurrently with these activities. ▪ Study and develop an economic stove production subsector through an entrepreneurial and commercial approach. Improved cook stoves allow for using less charcoal when cooking. These consumers mainly include urban

	populations and caterers and hoteliers.
Location	Around urban areas with important demand (Fenenerive-Est)
Expected results	30% of the production of fuel wood in the ER-P is produced under sustainable ways and linked to reforestation plantations (see activity FD2)
Beneficiaries	Local communities, charcoal producers
Potential executing agent or partners	Ministry of Energy, Local communities, charcoal producers, NGOs

Activity with direct impacts	ED 2 - Develop the use of renewable energy for domestic use
Description	This activity has two objectives: gradually reduce the share of charcoal in the full energy mix of ER-P and decrease the overall dependency on fossil fuels. With respect to this, the ER-P zone has substantial assets especially in terms of hydropower and biofuel production potential. The ER-P will therefore seek to collaborate with the Ministry of Energy to properly identify and locate these assets, while attracting the investments needed to set up energy production sites, providing a large part of the domestic energy locally and therefore reducing the impact on forests.
Location	Around and in urban areas
Expected results	30% of population currently located within areas dependent on unsustainable forest resource use for wood fuel production is benefiting from facilitated and low-cost energy alternatives systems.
Beneficiaries	Local communities,
Potential executing agent or partners	Ministry of Energy, Local communities, NGOs, economic operators

Activity with indirect impacts	EI 1 - Support the harmonization and development of the legal and institutional framework related to sustainable fuel wood supply, as well as the development of alternatives
Description	The development of the energy sector and its potential to attract investments are hampered by the lack of an appropriate legal framework. Draft texts have been developed but do not contain clear political and strategic foundations, i.e. objectives and needs are not defined ³⁴ . As such, the challenge for Madagascar is to develop a renewable energy strategy and policy that enables the country to use its full potential and take advantage of this opportunity, from the economic, as well as environmental and social perspectives, while setting up a framework favorable to

³⁴ « Plan directeur de la recherche sur les énergies renouvelables , 2014 – 2018 », Ministère de l'Enseignement Supérieur et de la recherche Scientifique, 2015

	<p>the development of investments in this subsector. Without claiming to change the legal framework on its own, the ER-P is the opportunity for demonstrating in a very tangible way that the development of the energy sector is compatible with deforestation reduction and decrease of the dependency on fossil fuel resources. To this end, ER-P will need to work in collaboration with relevant ministries to facilitate biofuel and solar, wind, and hydraulic energy production (cf. activity ED2).</p> <p>Fuel wood will, for the foreseeable future, remain the main source of energy used in Madagascar, especially at household level, since a large proportion of households gather wood. When they want to buy energy, charcoal and firewood still prove the most competitive on the market. Actions in the fuel wood subsectors will have to improve management of the fuel wood stock and address demand through the promotion of economic cook stoves. As such, actions will focus on revision and updating of regulations, multiplication of local community initiatives through fuel wood resource management transfer contracts, the use of development plans to set the acceptable use quota, and capturing lessons learned from the different areas of experimentation of Madagascar in the implementation of regional orders aimed at sustainably supplying the population with fuel wood and supporting a tax reform on charcoal in the different regions.</p>
Location	-
Expected results	New renewable energy strategy developed and appropriate regulatory texts are applied structuring and facilitating activities ED1 and AD2
Beneficiaries	-
Potential executing agent or partners	Ministry of Energy

Intersectoral activities

In order to facilitate deforestation and degradation reduction activities mentioned previously, and also to address the underlying causes of deforestation in a long-term view, the program will finance enabling strategies in terms of governance, institutional and legal frameworks, and land tenure. The activities presented below constitute a multi-level support for all stakeholders to create the necessary conditions for a transition towards sustainable development and efficiency of the ER-P. The aim of the actions outlined here is to strengthen significantly the institutions and the governance of natural forest resources

Activities with direct impacts	ID 1 - Increase the advantages delivered by biodiversity and ecosystem service conservation
Description	This activity mainly pertains to the development of PES schemes whose potential in Madagascar is very high. Madagascar is currently developing a national committee for PES in order to develop a specific national strategy, with the support of GIZ. This clearly shows that there is a political willingness to valorize natural resource in a sustainable way through PES schemes, and that in the future they will be important to take into account when promoting green development in Madagascar. The stakeholders participating in the design of the ER-P have identified PES schemes as an important element of the ER-P design, in order to more explicitly acknowledge and value the services that can be prioritized beyond carbon. Given the watershed approach of the Program, and the obvious extremely high biodiversity potential, the Program is specifically interested in approaches that increase value for actions that support water conservation as well as threatened biodiversity. One option under consideration is to identify those activities producing ER's that represent the highest additional value in terms of water or biodiversity, and incorporate that value into the price of the carbon, or to market this value through access to or design of more local-national programs that may support these efforts based on their impacts on water and biodiversity rather than carbon. By financing small to medium-scale PES systems, the ER-P will create an incentive that recognizes the added value to the country and to the world of these services, and may enhance effectiveness beyond carbon alone. It is noted that Madagascar is increasingly interested in PES schemes and that a national strategy is being developed.
Location	No specific areas.
Expected results	2 or 3 model PES projects within the ER-P will be ongoing in 5 years and will have proved their capacity to support a sustainable use of natural resources linked to forests and thus reducing deforestation of forest degradation
Beneficiaries	Local communities and natural resources monitoring entity
Potential executing agent or partners	Local communities and natural resources monitoring entity

Activity with indirect impacts	II 1 - Reinforce land security, including with reforestation actors
Description	<p>As explained earlier, land security that strictly consists in granting titles does not support the reducing of deforestation. However, land security remains a very important consideration for local actors, especially to address conflicts between customary rights and laws. To this end, the ER-P will:</p> <ul style="list-style-type: none"> ▪ Initiate consultation, define activities, and share responsibilities among the different sectors involved in forest area security (including secondary forests and forest fallows); ▪ Update communal zonings by supporting the development and implementation of land use planning schemes/strategies at the regional and communal level (SACs, as well as SARs and their SRATs) where deemed necessary by regional stakeholders; ▪ Reinforce the operational implementation of the Act on Land Security in relation with Reforestation (LSR); ▪ Support the acceleration of the registration of protected forest areas; ▪ Generalize the forest mapping and spatial management plan process and register these forest areas in the regional and communal development plans, ensuring consideration of traditional structures.
Location	Everywhere in the ER-P where REDD+ activities are implemented. This activity will be a conditionality of all sectorial activities.
Expected results	All REDD+ projects within the ER-P will have contributed to the elaboration of communal zoning plan in coherence with their activities
Beneficiaries	All communities concerned by REDD+ project
Potential executing agent or partners	-

Activity with indirect impacts	II 2 - Improve the coordination and monitoring of mining developments and ensure the setting up of compensatory reforestation
Description	<p>Over the coming years, the mining sector could actively contribute to the country's development, although, over the past years, a strong increase in small-scale and illegal mining within these same protected forest areas provides an indication of how poorly managed the sector is.</p> <p>The country should once again commit to formalizing and enhancing the added value in small-scale mining subsectors. Numerous initiatives attempting to formalize small-scale gold or precious stone mining were conducted in the past and their success were most of the time limited to the local level and the duration of the technical assistance. The informal character of the activity and smuggling remain major challenges. Whereas the national production is estimated to range</p>

	<p>between 2 and 10 tons per year, gold declarations registered in 2010 and 2011, for example, are anecdotal. Obviously, the loss of revenue for the Government amounts to millions of dollars. The revenues that the Government officially derives from small-scale gold mining are very low. Although prospects that these revenues will substantially increase are limited (international experience shows relatively little success in this area), without access to funding and other guarantees offered by official registration, small-scale miners' chances of escaping poverty are very low. The success of the activities to be undertaken is conditioned by the definition of a plan to formalize the gold and precious stone subsectors; this plan should allow for laying the foundations of good governance and preventing and mitigating the impacts of small-scale mining.</p> <p>Although ER-P cannot claim to solve all problems relating to the mining sector, it will need to:</p> <ul style="list-style-type: none"> ▪ Support the decentralized management of small-scale mining activities to ensure local revenue collection, management, and sharing ▪ Participate in the compliance control of the legislation and Mining Code ▪ Sensitize and, where applicable, train communities and actors of the subsector and enable them to structure themselves into associations to defend their interests. ▪ Ensure the environmental conservation of forests by setting up a mineral warning system to avoid rush of artisanal miners, and also setting up prevention and management system or by promoting the environmental rehabilitation of mining sites. ▪ Improve the added value of the sector. This value is currently marginal in small-scale mining as most stones and metals are exported in a raw state. The ER-P could especially support the efforts of the Madagascar Gemology Institute (IGM) to address this problem.
Location	Mostly in the CAZ area, but also in others PAs (managed by MNP)
Expected results	Increased number of artisanal miners will be realizing their exploitation in a legal, sustainable way, inclusively with local communities in order to share benefits. In the same time, communes involved in such processes will have implemented partnerships with operators to operate compensatory reforestation.
Beneficiaries	Artisanal miners and local communities
Potential executing agent or partners	Artisanal miners, Ministry of Mines and Oil
Activity with indirect impacts	II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level

Description	<p>To ensure effectiveness and stakeholder commitment, as well as better coordination of actions at the local level, the ER-P will support the creation of SLCs where none are set up yet, ensuring gender parity, and will sensitize these SLCs and build their capacities regarding REDD+ issues, as well as the ER-P and its operational arrangements and sustainability in relation with performance.</p> <p>Considering the lessons learned and previous results of the management transfer evaluation, it appears necessary to build the capacities of the communities both regarding existing management transfers and new TGRNs to be set up. As such, the ER-P will have to build local capacities relating to Natural Resource Management Transfers (TGRNs).</p> <p>Lastly, to ensure intersectoral coordination at the local level and consistency among all economic activities, the ER-P will also build the capacities of the agents of administrations of sectors other than forestry but linked with REDD+ issues (MPAE, Communes, etc.), depending on local needs: STDs and CTDs.</p>
Location	-
Expected results	All communes concerned by REDD+ projects will have structured and operationalized SLCs. When necessary, TGRNs will be implemented to support/monitor projects.
Beneficiaries	-
Potential executing agent or partners	-

Activity with indirect impacts	II 4 - Align the legal framework with the institutional one conducive to the good governance of the REDD+ mechanism
Description	<ul style="list-style-type: none"> ▪ In line with the National REDD+ Strategy, the ER-P will need to provide a tangible foundation for the development of a legal and institutional framework favorable to the good governance of forest resources in general, including REDD+: ▪ Revise and complete regulatory texts in force (decree, order, etc.) to ensure the integration of the REDD+ dimension into sectoral policies. ▪ Reinforce the staff numbers, equipment, and technical capacities of the forest administration in charge of implementation at all levels (DREEF, BRC REDD+, PR REDD+, etc.). ▪ Improve the legal framework governing Natural Resource Management Transfers (TGRNs) to develop community-based forest resource management (for protection of forests and/or forests dedicated to sustainable production).
Location	-

Expected results	A set of different decrees or other regulatory texts will clearly define all legal aspects of the REDD+ mechanism and enable its efficiency as a real intersectoral and green economy policy. This means a strong coordination with other sectoral ministries will be ensured.
Beneficiaries	-
Potential executing agent or partners	-

4.4. ASSESSMENT OF LAND AND RESOURCE TENURE IN THE ACCOUNTING AREA

a. *Overview of forest and land tenure in Madagascar*

The Madagascar forest and land tenure act is based on the country's Constitution - the most recent constitutional document was adopted in 2010 - and on specific acts and legislations, including the 2005 Land Act, the Act on Ownership and Obligations (Civil Code), the 1997 Forestry Law, as well as on community-based governance tools.

Principle of public ownership

While recognizing individual right to property (Article 34), the 2010 Constitution does not include any references to land or natural resources, except in its preamble and in Article 139 which stipulates that "any land that is unoccupied and without owner shall belong to the State...".

The *presumption of public ownership* dates back to precolonial times. This system created a legal environment where any land that is not registered to an individual automatically belongs to the State.

The act laying down the principles governing land status (2005)³⁵ and the act laying down the legal provisions applicable to private non-titled land ownership (2006)³⁶ - which are the key elements of the modern land reform - have largely rejected the principle of public ownership.

Together, these recent acts are going against the default provision that any land that is not registered to an individual belongs to the State. Instead, land needs to be registered in the name of the State, public establishments, or decentralized jurisdictions ("CTDs")³⁷ to be validly titled to the State. Furthermore,

³⁵ Act n°2005-019 laying down the principles governing land status.

³⁶ Act #2006-031 laying down the legal provisions applicable to non-titled land ownership.

³⁷ It is noted that although the decentralization of the government in Madagascar is an integral part of the Constitution - cf. Article 139 stating that CTDs "having legal personality and administrative and financial autonomy, form the institutional framework of effective citizen participation in public affairs management..." and that they "have assets that include a public domain and private domain..." - no transfer of ownership has yet been effected.

individuals have been given the right to claim, and the procedural means to provide evidence for it, that a particular non-registered piece of land is theirs ("non-titled property")³⁸ (Art. 21 of the 2005 Act).

The 2006 Act specifies that private non-titled ownership is acknowledged on all lands, "urban, as well as rural, [...] on which ownership was gained according to the customs and practices of the time and place" (Article 2).

It is noted that the management of non-titled property registration - including the procedural roll-out - falls to CTDs, and that recognition of non-titled property positions, in all cases, is subject to the existence of a Local *Land Use Plan* (also to be prepared by CTDs, in collaboration with the Land Agency ("*Services domaniaux et topographiques*") to provide land demarcation data, Article 4 of the 2006 Act). Both individuals as well as groups of persons may apply to have their non-titled property recognized (Art. 6 of the 2006 Act). The recognition procedure is "public and attended by all concerned parties", and conducted by a local recognition committee (Art. 11). Where the application is approved, the applicant receives a "land certificate" (Art. 13) which "shall entitle the holder [...] to perform any legal act pertaining to real rights and any of their dismemberments recognized by the legislation in force" (Article 17).

It is specified in implementing regulations³⁹ that CTDs provide special services - "Land Offices" - that encompass the recognition process of private non-titled ownership as a whole, including the conversion of the land certificate into a full land title ("registration"). Such conversion is an option to the holder, not an obligation.

It should be noted that there are remnants of the previous 'presumption of public ownership' system. The 2005 Act excludes from its scope any vacant, unused land, specifying that "lands that have never been occupied or owned" are the private property of the State (Article 18). ("State" always refers to the central government - not CTDs.)⁴⁰

It is also noted that land covered by the Protected Areas legislation, as well as any "area [...] legally defined as covered by the Forestry Law..." remains excluded from the provisions on non-private ownership (Article 38). However, both exclusions do not create a simple fallback to the presumption of public ownership. The *act on the private property of the State, Decentralized jurisdictions, and legal entities under public law* (2008)⁴¹ clarifies that even in the absence of a process for individuals or groups to claim (non-titled) property rights, the public claim is not automatic. Instead, the State must trigger a

³⁸This term encompasses all "urban and rural lands subject to land holding systems expressed through actual, evident, and permanent individual or collective holding, as per the practices of the time and place, and according to the intended land use [...]" (Art. 33 of Act 2005) - indirect (and conditional) confirmation of customary rights.

³⁹ Decree #2007-1109 implementing Act #2006-031 dated November 24, 2006, laying down the legal provisions applicable to private non-titled land ownership.

⁴⁰ Cf. Article 4 of Organic Law #2014-018 governing the jurisdictions, organizational and operational arrangements of Decentralized jurisdictions, as well as those for the management of their own business: "Decentralization is transferring to Decentralized jurisdictions, jurisdictions that are their own and distinct from those of the State."

⁴¹ Act #2008-014 dated July 23, 2008.

registration process in its own right. Any "non-titled land that is not developed [...] shall be registered in the name of the State according to a simplified procedure [...]" (Art. 18).

Forest governance

Under the 1997 Forestry Code,⁴² "natural forests such, as Natural Integral Reserves, National Parks, Special Reserves, Classified Forests, State-owned Forests, and Forest Reserves" (Art. 12) are, among others, subjected to the provisions applicable to forests. Private forests are subject to the provisions applicable to forests if the owner has submitted a specific application (Art. 13). The law does not specify any prior right based on non-titled customs. It only recognizes the possibility for the Ministry in charge of Forests (represented in this case by its regional offices) to deliver "timber permits [...] for strictly personal needs to individuals" to allow for "the effective participation of rural populations in the sustainable conservation of renewable natural resources [...] and exercise of their traditional individual or collective rights of use" (Art. 40 and 41). The title of the section refers to the "*Fokonolona*" (the traditional clan-based governance system⁴³ recognized by the Constitution as the "foundation of development and sociocultural and environmental cohesion" - Art. 152).

The Forestry Law, as such, does recognize the existence of customary laws but does not provide legal guarantee that they can be claimed in any particular situation ("timber permits *may* be granted...", Art. 40)⁴⁴ and is far from offering any way of registering property.

It is noted that a Forestry Code is under construction and the first version should be adopted in 2017 or 2018. The new act will introduce a new definition of the forest, emphasizing operational contribution in terms of environmental (cultural) services rather than tree numbers.⁴⁵ The new code refers to REDD+, indicating that a more descriptive (and restrictive) definition of what makes a forest eligible to REDD+ will be adopted through delegated legislation.⁴⁶

Grassroots governance

As provided for under the 1997 Forestry Law, one needs a permit⁴⁷ to use the forest – either a "timber permit" as per the Forestry Code, or, as per the 1996 "**GELOSE**" Act⁴⁸, a "management contract" on

⁴² Act #97-017 on the revision of the legislation.

⁴³ "Foko" means "clan" and "olona" "person", cf. A. Delière, *Pratique économique et transactions avec les ancêtres* (2012).

⁴⁴ Italics added here.

⁴⁵ "Forest: Ecosystem ensuring or designed to ensure production services, regulation services, support services, and cultural services as defined by the Environmental Charter and provided by woody vegetation."

⁴⁶ "Forests eligible under REDD+: Any area covered with woody plants (trees, shrubs, and bushes) whose minimum surface area, height, and coverage are defined by regulatory means..."

⁴⁷It is however noted that some ambiguity exists regarding the act governing right of use when there is no formal permit or authorization deed. The Forestry Code fails to address the matter. Ministerial decree #98-782 stipulates under its Art. 5 that

specific renewable resources including "forests, fauna, and flora" (Art. 2 of the GELOSE Act), negotiated between the Government (or CTD), on one hand, and a "grassroot community" ("*Vondron'Olona Ifotony*" or simply "V.O.I."), on the other hand. Grassroot communities are, according to the law, "any group of individuals that gathered on a voluntary basis, united by the same interests, and abiding by common rules of life" (Art. 3). The process involves different steps and requires the signature of different institutions (including the Mayor and relevant Communes). There are no *a priori* restrictions on space or land. Any land belonging to the State (or a CTD) is *a priori* eligible, as long as it is customarily developed by the relevant community. So far, only State-owned land has been put under contract under the GELOSE system.⁴⁹

In spite of the intersectoral intentions and commitments, including preferential tax treatment, and advanced compliance structures focusing on customary governance and dispute settlement procedures ("dina"), few local communities initially engaged with the GELOSE framework.⁵⁰ To remedy this, in 2001, the Ministry of Water and Forests introduced a specific and simple version of forest management at grassroot level: contract-based forest management ("*gestion contractualisée des forêts de l'État*" or "GCF").⁵¹ GCF contracts are bilateral agreements between the forest administration and the "grassroot community" or V.O.I. (normally a village or group of villages) that do not require the additional approval of the "local committee" made up of the mayor, a member of the Commune Council, and a representative of the forest subdivision (Article 10 of the decree). The management contract is initially entered into for a period of three (03) years (Art. 7) and is renewable for a period of ten (10) years. The rights and obligations of the grassroot community are laid down by a logging agreement (Art. 21). The results yielded by the GCF mechanism (approximately 1,250 contracts had been negotiated as of late 2015)⁵² were but partially conclusive in terms of natural resource protection and livelihood improvement (cf. hereafter, Chapter 4.5).

Large-scale logging concessions

As per the act, no logging permit (including on mangrove forests and estuary forests) may be granted unless a development plan has been prepared.⁵³ Timber and forest land concessions come in several forms and may be granted for forest areas classified as production forest. The collection, haulage, and marketing of specific types of wood is totally prohibited.⁵⁴

"subject to specific provisions governing the exercise of rights of use, no forest product subject to the provisions applicable to forests may be collected without a logging agreement, logging permit, timber permit, collection permit or a management contract entered into as per Act #96-025..."

⁴⁸ Act #96-025 dated September 30, 1996 on the local management of natural renewable resources ("GELOSE").

⁴⁹ M. Ramamonjisoa / G. Ruta, Analysis of Community Forest Management (CFM) in Madagascar (World Bank 2015).

⁵⁰ I. Scales, Conservation and Environmental Management in Madagascar (2014).

⁵¹ Ministry of Water and Forests, Decree #2001-122 laying down the implementation conditions for contracted management of State forests. It is noted that this decree was introduced under the legal mandate of the Forestry Code and not under GELOSE.

⁵² M. Ramamonjisoa / G. Ruta, op. cit.

⁵³ Decree #98-782 (Art. 7 and Art. 10).

⁵⁴ Decree #2010-141.

Protected areas

The Protected Area land tenure system - as consolidated in *Act 2015-005 on the restructuring of the Protected Area Management Code* - makes the distinction between the different types of sites: national parks and natural parks, special reserves, natural monuments, protected harmonious landscape, and natural resource reserve.

Types of Protected Area governance include public governance, shared governance or co-management of the collaborative or joint type, private governance, and community governance. Customary rights of use are generally recognized and an actual identification procedure exists for all Protected Areas. Nevertheless, the act provides for - and authorizes against compensation - the restriction of rights of use "[required] by the setting up and management measures of a Protected Area" (Art. 6 of Act 2015).⁵⁵

Agricultural land

Seventy-seven percent (77%) of the rural population lives under the national poverty threshold and the poorest are the ones who do not own land. Land ownership in Madagascar is extremely fragmented. The average surface area of the plots amounts to approximately 1 hectare, ranging from an average of 0.5 hectare for the poorest households to an average of 1.8 hectare for the wealthiest.⁵⁶

The fact that all lands (to the exception of vacant lands) are no longer subject to the principle of public ownership and the emergence of mechanisms for allocating land to individuals beyond formal titling through the introduction of "*non-titled property*" and the establishment of "land offices" across the country, have made it possible to incrementally formalize and consolidate the land rights of local populations, especially subsistence farmers - which is no less than a historic innovation.⁵⁷ It is estimated that 90% of farmers farm their own land⁵⁸ but most of them do not have the formal recognition granted by a title. Once fully implemented, land offices will make the use of "small papers" - i.e. informal and non-

⁵⁵ For a critical discussion, cf. S. Aubert / S. Rambintsoatra / J. Razafarijaona, *L'insécurité foncière dans et autour des Aires Protégées de Madagascar*, 4 Développement durable et territoires (2013) 1.

⁵⁶ USAID, Property Rights and Resource Governance (2009).

⁵⁷ T. Crowl, *Land Rights Among Subsistence Farmers: An Examination of Madagascar's Land Reform and Prevailing Systems of Land Tenure in Betafo* (2014) notes that the conventional registration procedure (titled lands) is comprised of fourteen (14) steps and lasts 6-10 year on average.

⁵⁸ Bellemare, Marc F. 2009. Sharecropping, Insecure Land Rights and Land Tenure Policies: A Case Study of Lac Alaotra, Madagascar. *Development Policy Review* 27(1):87-106.

legal documents issued by *Fokontanys* (institutions of grassroots *Fokonolona*) as replacements of the formal land title - redundant.

Mining

Madagascar is an important mining country as it is home to different minerals and precious and semi-precious stones, including sapphires, gold, uranium, and rare soils. The government is seeking to increase the sector's contribution to the GDP from 2% to 15%⁵⁹. The key legal instruments governing mining are Act 0999-022 dated July 30, 1999 on the Mining Code, amended by Act #2005-021 dated October 17, 2005 and Decree #2006-910 dated August 19, 2006 on the implementation of the Mining Code. The code lays down that all mineral deposits are the property of the State (Art. 3). Beneficiaries of mining permits must either be citizens (small-scale permits; small-scale miners) or residents (large-scale permits) of Madagascar.

Mineral exploration can be conducted freely across the national territory, outside of protected areas (Art. 20). Mining permit holders have the obligation of maintaining good neighborly relations with local populations in general, land owners, traditional occupants, and especially usufructuaries (Art. 307 of the 2006 Decree). Where a mining permit holder wishes to conduct business on a land belonging to the private domain of the State, decentralized jurisdictions, or any other legal entity under public law, it must enter into a contract with the authority in charge of the domain's management, as well as with traditional occupants and usufructuaries - where applicable, before beginning any work or operation.

b. *Rights to Emission Reductions*

Forests under administrative or delegated management

Although Madagascar is pioneering the development of "carbon" projects, including in the forest sector, the legal concept of carbon rights remains vague. However, some reference to the linkage of "environmental services" and "carbon markets" can be found in the country's key programmatic policy document, the Environmental Charter (Act #2015-003 Environmental Charter) which stipulates that "[all] legislative texts, sectoral policies, plans, programs and projects must consider: [...] fair sharing of the benefits derived from environmental services through: [...] the use of the income generated from "carbon" markets [...]" (preamble).

⁵⁹ <http://www.rfi.fr/afrique/20170116-madagascar-projet-refonte-code-minier-est-rails>.

Regarding specific legal instruments, the Madagascar law has implemented the Kyoto framework⁶⁰, including provisions relating to the *Clean Development Mechanism* (CDM which leads to the creation of a form of international credits). Explicit statutory recognition of “carbon rights” or “title to emission reductions” is missing, however. There is a single reference, in delegated legislation (Decree #2013-785, adopted by the Ministry of Waters and Forests), to the term “*les carbonnes forestiers*” (“forest carbon”). The decree in question lays down the delegation arrangements of State-owned forests to public and private entities, under the Forestry Code and the Protected Area Management Code, among others.⁶¹ The decree, however does not offer any explanation of the term or specific detail of what “forest carbon” (the original language uses, in fact, the plural (“*carbonnes forestiers*”) is or what it represents. If anything, it seems to refer to CO₂ stocks sequestered and materialized in the forest, mirroring language used in carbon stock assessments.⁶² This does not, however, grasp the concept of “emission reductions, the underlying activities and claims. It is also noted, in this context, that the consolidated version of the Revised Forestry Code, which introduces the concept of REDD+, does not use the term “forest carbon” (“*carbonnes forestiers*”) or similar language.

To understand the meaning of rights and claims to REDD+ emission reductions in the context of Malagasy law, one needs to describe the REDD+ concept with domestic legal terms. Three characteristics seem central to the REDD+ concept and its expression in the Malagasy legal sphere:

1. The implementation of a set of actions linked with the forest (“*service*”); REDD+ activities represent an *effort* (“environmental service” in the language of the Malagasy Environmental Charter) concerning the forest; yet such service is not inherent in a particular piece of land or a tree. The effort may consist in reforestation activities of a particular stretch of land or – further removed from particular lots of land – in introducing certain practices (e.g. patrolling) or policies (e.g. concerning supply chain controls) with an impact on country- or jurisdiction-wide deforestation.

2. The generation of a result in terms of increased sequestration or greenhouse gas emission reduction (“*result*”); REDD+ is incomplete as an activity alone; it is essentially a ‘results-based’ concept. The reforestation activities must result in permanent sequestration gains and the introduction of certain practices or policies must show in actual emission reduction results.

3. The translation of these results into exchangeable units (“*valorization*”).

⁶⁰ Decree #2012-690 dated July 1, 2012, laying down the Procedures for carbon project approval and national carbon register setting up and management in Madagascar; Order #24317/2012 defining the Conditions relating to the implementation of Decree #2012690 dated July 10, 2012, laying down the Procedures for carbon project approval and national carbon register setting up and management in Madagascar.

⁶¹ “All wood and non-wood forest products, material or non-material, including forest carbon, shall remain State property and their management shall exclusively fall to the Forest Administration.”

⁶² E.g. Voir FAO, Evaluation des Ressources Forestières Mondiales 2010: Rapport National Madagascar (2010), <http://www.fao.org/docrep/013/al556F/al556F.pdf>.

A REDD+ transaction involves the commodification of the REDD+ results adding transparency obligations – in the form of a registry – and exclusivity obligations, namely the guarantee that the same REDD+ results will not be commodified again and that the same REDD+ activities will not give rise to additional compensation from another REDD+ transaction.

The domestic legal regime that applies to these core characteristics is the Malagasy Code civil, whose law of obligations gives the provider of a service, which gives rise to a valuable result, a right or remuneration, either on the basis of a contract or tort using the principles of *negotiorum gestio* (*gestion d'affaire*) and unjust enrichment (*enrichissement sans cause*). The right of remuneration is guaranteed for all stakeholders (then 'service providers') that actively and voluntarily contribute to the specific REDD+ activities and REDD+ result.

It is noted that the service rendered to the ultimate beneficiary of, i.e. the recipient of the commodified good, is a dual one: It consists, first, in the emission reduction (and sequestration) gains, and second in the guarantee not to market the same REDD+ results to anyone else (whether in the country or beyond).

It is also noted that the Malagasy Code civil (and the relevant set of judicial rights) does not only give rights to those stakeholders that actively contribute to achieving the REDD+ result, but also to those that are negatively impacted in their property or in other land tenure rights. The latter stakeholders are given protective claims both in the form of injunctive relief in the form of compensation.

c. *Description of land rights in the ER-P area*

The forms of tenure in the program area vary, on one hand, according to levels of urban development and according to types of landscape, on the other.

Titled land is almost exclusively found in urban areas or rural centers. Communes with a higher level of urban development sometimes also have a land office. This allows for registering land considered as non-titled property. The more distant urban or rural centers are, the scarcer titled or registered (non-titled property) land becomes, and owner-farmed land becomes the standard (small plot farming).

Owners who farm their own land farm three of the four types of land. The first type is the irrigated bottom of a valley with its rivers and main channels, where rice farming, horticulture, and cattle farming are most widespread. The second type is characterized by slopes where contour and terraced farming is practiced, and some cattle farming, various forms of agriculture, and tree fruit production. Type 3 refers to the higher slopes where reforestation and forestation through forestry and agroforestry are possible. The fourth type includes protected areas and intact forest corridors. (cf. section 5.3.1)

Approximately 70% of the program area falls in the fourth category, two thirds of which are designated protected areas. Three out of five protected areas are managed by the Administration, one has been delegated to the *Wildlife Conservation Society* (WCS) non-governmental organization, the other to the *Conservation International* (CI) non-governmental organization. Inside and outside of the protected areas,

a string of grassroot communities (V.O.I.) has been set up and mandated to (co-)manage a forest area. Part of the program area (outside of protected areas) is classified as production forest and is under forest concession with a State-owned company.

A number of active mines occur across the wooded areas; the largest ones are managed on the basis of formal concessions; the smallest ones are considered as small-scale mines for which mayors grant semi-legal ad hoc permits;

The 30% remaining of the project area are agricultural or urban lands. Agricultural lands are occupied by smallholders who have non-titled ownership. The process for formalizing ownership (registration) is ongoing in a number of Communes who have set up Land Offices. Most Communes do not yet offer land office services (nor local management plans needed to ensure registration). *Small papers*, issued in lieu of official titles, are largely used; disputes are settled by traditional authorities.

Forest lands are still being incrementally encroached on by the *tavy* mechanism - a traditional practice that is little regulated by formal law - and mining.

d. *Challenges on ER-P and program inputs intended to overcome them*

Land ownership control in the project area and sustainable planning with land partners face a number of difficulties, most of which are related to lack of capacity and procedural efficiency.

Regarding the certification of non-titled property, there often is no Land Office set up and the development of local land occupation plans - a condition to the issuance of land certificates - is often delayed. Although this does not directly impact forests, it has indirect consequences for it in that it removes the need for clear delineation of plots, protection (as well as taxation) and encourages forest encroachment.

ER-P cannot replace and compensate for the incomplete land reform process; however, the program will help with various things:

- It will build capacity at all government levels, helping ultimately the process of land recognition;
- It will reinforce community-focused measures (notably, in the beginning, PADAP) and engage with self-governing bodies through the process (see the chapter on Institutions and, in particular, the use of Local Concertation Structures); and
- It will secure rights for remuneration (carbon or non-carbon benefits) for everyone actively engaging with the program, notably including farmers – irrespective of whether their claim to the land has been formally approved or not – and as program stakeholders and participants, they will benefit in accordance with the Benefit Sharing Plan;
- The Program, thus, can stay clear of the land recognition process and be an inclusive tool for all farmers.

In particular, ER-P, through the sustainable landscape management it proposes, will build the capacities and equipment of government institutions in charge of providing rural households with specific services and inputs, including agricultural service centers and communal land offices ("Land Offices"). As for local government institutions, the preparation and validation of REDD+ and landscape management plans, and

their implementation will improve the planning, budgeting, monitoring & evaluation, and execution capacities of the landscape approach, including the protection of conservation areas and biodiversity.

The implementation of ER-P will also contribute to the integration of sustainable land use and forest protection concerns to different portfolios of the Ministry (intersectoral landscape approach). This is the reason behind the National Land Development Scheme, however, it has not been fully achieved and the intersectoral approach has not yet been integrated to municipal plans whose development is often delayed.

Regarding forest land registration – the lack of which incites communities and their representatives to deliver mining titles and *tavy* permits - the program will help implement full and complete delineation of the program area and beyond.

In forest areas, activities with local communities were not always successful and some questioned the environmental merits of grassroot governance (GELOSE and protected area governance system).⁶³ Other people commented that the lack of success was due to the fact that the communities had too little incentives to manage forests in a sustainable way.⁶⁴ The REDD+ program aims to create real benefits for the communities and develop their natural resources through performance-based financial support.

This analysis is reflected in the description of Activity II1 in Section 4.3.3.

4.5. ANALYSIS OF LAWS, STATUTES AND OTHER REGULATORY FRAMEWORKS

The proposed program activities are compatible with the international treaties and covenants ratified by the Republic of Madagascar, as well as with the relating national legislation.

- African Convention on the Conservation of Nature and Natural Resources;
- Convention on Wetlands of International Importance especially as Waterfowl Habitat;
- Convention concerning the Protection of World Culture and Natural Heritage;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora;
- Convention on the Conservation of Migratory Species of Wild Animals;
- United Nations Framework Convention on Climate Change;
- Convention on Biological Diversity;
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa;
- African Convention on the Conservation of Nature and Natural Resources;
- The 2006 International Tropical Timber Agreement;

⁶³ Rasamoelina, Ruta et al., Analysis of Community Forest Management (CFM) in Madagascar (World Bank 2015).

⁶⁴ Bertrand et al., Madagascar, politique forestière: Bilan 1990 – 2013 et propositions, 9 Madagascar Conservation & Development (2014) 20.

- The Kyoto Protocol to the United Nations Framework Convention on Climate Change;
- The Nagoya Protocol on the Fair and Equitable Sharing of Natural Resources.

More recently, the Republic of Madagascar actively participated in the negotiation of the Paris Agreement. The government introduced its Nationally Determined Contribution ("NDC") which defines the targets and scope of its commitment for the coming years. The Malagasy NDC particularly mentions the dual role that the forest and biodiversity play in "REDD+ promotion"-based adaptation and mitigation which is one of the key activities mentioned. For a specific analysis of the incidences of private and public law on the considered perimeter, cf. Chapter 4.4. above.

Table 6: Summary of the main acts having incidence on the existing land occupation and use system

Legislative act	Type of legislation	Description	Impact on the program
2010 Constitution	Constitutional Act	<ul style="list-style-type: none"> ▪ Lays down the constitutional provisions and principles of public governance; ▪ Guarantees the right of ownership and individual legal protection; 	<ul style="list-style-type: none"> ▪ Constitutional framework for the long-term continuity of the program;
Act laying down the principles governing the land status (2005) ⁶⁵	Parliamentary Act	<ul style="list-style-type: none"> ▪ Defines the presumption of non-titled ownership; ▪ Specifies that non-titled ownership does not apply to protected areas and other forests; 	<ul style="list-style-type: none"> ▪ Impact on all agricultural lands;
Act laying down the legal provisions applicable to non-titled land ownership (2006). ⁶⁶	Parliamentary Act	<ul style="list-style-type: none"> ▪ Defines the non-titled property registration procedure (local land use plans, land certificates, etc.) ▪ Legal source of "Land Offices"; 	<ul style="list-style-type: none"> ▪ Land offices were set up in several communes of the program, but others still lack them; ▪ Local land use plans often missing;
The act on the private domain of the State, Decentralized Jurisdictions, and legal	Parliamentary Act	<ul style="list-style-type: none"> ▪ Provides a simplified procedure for forest domain registration; 	<ul style="list-style-type: none"> ▪ As long as registration is not completed, forest encroachment is legally possible (development

⁶⁵ Act n°2005-019 laying down the principles governing the statuses of land.

⁶⁶ Act #2006-031 laying down the legal provisions applicable to non-titled land ownership.

entities under public law (2008) ⁶⁷			<p>through tavy and mining especially);</p> <ul style="list-style-type: none"> ▪ The program will seek to facilitate full registration;
1997 Forestry Law ⁶⁸	Parliamentary Act	<ul style="list-style-type: none"> ▪ Provides the definition of forests; ▪ Legal foundation for the classification of forests and their administration; ▪ Facilitates the effective participation of rural populations in the sustainable conservation of natural renewable resources... [and] individual or collective exercise of their traditional rights of use; ▪ Recognition of the "Fokonolona" governance; ▪ Decree 	<ul style="list-style-type: none"> ▪ The program area is for the most part comprised of forests (cf. nevertheless the regime specific to Protected Areas, infra); ▪ The program area includes, among others, forests classified as production forests;
Revision of the Forestry Code pending	Draft parliamentary bill	<ul style="list-style-type: none"> ▪ Includes a holistic definition of forest ecosystems; ▪ Provides for the implementation of REDD+ (subject to a new implementing legislation); ▪ 	<ul style="list-style-type: none"> ▪ The new provisions should not affect the implementation of the REDD program; ▪ Future implementing acts may reconfirm the current activities of REDD+;
Act 2015-005 on the revision of the Protected Area Management Code	Parliamentary Act	<ul style="list-style-type: none"> ▪ Defines the current framework for setting up and governing protected areas; 	<ul style="list-style-type: none"> ▪ The program area several PAs;

⁶⁷ Act #2008-014 dated July 23, 2008.

⁶⁸ Act #97-017 on the revision of the forest legislation.

<p>Decree #2013-785 setting the delegation arrangements of State-owned forests to public and private entities</p>	<p>Delegation act under the 1997 Forestry Law and Protected Area Management Code</p>	<ul style="list-style-type: none"> ▪ Allows for delegating the management of forests and protected area to public individuals or legal entities, "especially formal Associations, NGOs, and any formal organization in the case of Protected Areas"; ▪ Sets the obligation of fees on ecotourism (art.50); ▪ Provides for a "public-private partnership to find sustainable funding" (Art. 51); ▪ Defines "forest carbons" as a forest product (Art. 52) and provides for the adoption of an implementing order to define the "forms of development and percentages earmarked for the Forest Fund (Art. 53)"; 	<ul style="list-style-type: none"> ▪ Two (02) cases of delegation of the management of Protected Areas: delegation to WCS and to CI; ▪ provides a sectoral legal classification of "forest carbon rights";
<p>Act #96-025 dated September 30, 1996 on the local management of natural renewable resources ("GELOSE")</p>	<p>Parliamentary Act</p>	<ul style="list-style-type: none"> ▪ Allows the transfer of forest governance and management powers to local communities; 	<ul style="list-style-type: none"> ▪ A set of forest areas within program boundaries is under community management;
<p>Ministry of Water and Forests, Decree #2001-122 laying down the implementation conditions for contracted management of State-owned forests.</p>	<p>Delegation act</p>	<ul style="list-style-type: none"> ▪ Simplified version for community-based forest management. 	<ul style="list-style-type: none"> ▪ A set of forest areas within program boundaries is under community management.

4.6. EXPECTED LIFETIME OF THE PROPOSED ER PROGRAM

In order to ensure its full efficiency in the long term, the program is expected to last a minimum of 10 years. But a further analysis will seek to estimate opportunities and results over a long-term scenario of 20 years.

5. STAKEHOLDERS CONSULTATION AND PARTICIPATION

5.1. DESCRIPTION OF STAKEHOLDERS CONSULTATION PROCESS

a. *Creation and consultation of managing entities of the ER-P*

As described in Section 2.1, national preparation for REDD+ has made significant progress in Madagascar. Progress has been achieved in large part through active participation of stakeholders at all levels, but also because the ER-P development process ran in parallel to the national readiness process, which allowed for the design of a national REDD+ mechanism to be based on a concrete example of application.

As of today, some of the institutional structures core to the implementation of the ER-P are already in place and operational, and have been actively participating in the development of the ER-P design:

- The **National REDD+ Platform (PFN REDD+)** was officially created by Ministerial Order No. 14569/2016 in October 2016. This multi-stakeholder platform, with a mix of government (12 ministries are represented) and non-government representation, ensures the strategic orientation of the REDD+ process at the national level and is playing a central role in the development of the ER-P.
- The **Regional REDD+ Platforms (PFR REDD+)** for the ER-P zone (Analanjirofo, Alaotra Mangoro, Sava, Sofia, Atsinanana). These bodies have already been convened twice with the active participation of BNC REDD+: a first time to present their understanding of the functioning, stakes and key stakeholders involved in a REDD+ mechanism and to identify the operational procedures and members of the platform; and a second time to share and receive information on the ER-P's key elements, as well as express expectations, concerns and recommendations, which have been incorporated into this document. The PFR REDD+ also participated in the various consultations carried out as part of the technical studies commissioned by BNC REDD+, including: review of deforestation and degradation drivers, SESA, development of the GRM, SIS and analysis of the political economy of deforestation. With their involvement in the process, the PFR REDD+ ensured that regional priorities and issues were addressed. These platforms were set up as an expansion of the previously existing Forestry Commissions but with the inclusion of additional stakeholder representatives including an expanded role of civil society. The regional orders officially creating these platforms are being finalized, and are expected to be promulgated in October 2017.
- The **REDD+ Civil Society Organization (CSO REDD+)** was established in early 2017 as an informal coalition solely consisting of civil society members, to enhance the sharing and dissemination of information to civil society, and provide a CSO voice. The role of this platform, although not as formal as other platforms, is to support the REDD+ and the ER-P consultation processes through the preparation and implementation phases, and to ensure that social issues, information and

participation of all stakeholders, including vulnerable populations, are routinely taken into account and addressed.

- The **Carbon Methodology Group (GMC)**: this group has been operating informally in collaboration with BNC REDD+. It is comprised mainly of technicians and experts in the methodological aspects of carbon accounting and forest monitoring such as forest inventories, MRV and NFMS systems, calculation of baseline levels, etc. Its members are representatives of many REDD+ partner entities and the government agencies that participate in the group's activities on a volunteer basis according to the topics addressed. It should be noted that, for the preparation of the ER-P baseline, a specific smaller group was created, named the **REL Technical Group**, bringing together experts with experience in satellite image spatial analysis and calculation of baseline levels. This group was set up to monitor the technical details of the different stages of the ongoing work and to provide recommendations with respect to the methodology and results of the ER-P baseline level. They have continued to debate, modify and validate the technical aspects of carbon methodology so that is appropriate for the specific context of Madagascar.
- The **Technical Group on Safeguards (GTS)**: this group has been operating informally in collaboration with BNC REDD+. The group focuses on all aspects of safeguards and on identifying measures that could be put in place to assess and mitigate the social and environmental risks of REDD+ investments. Work has been focused largely on the ER-P zone. The group took an active part in clarifying the Cancun safeguards and their interpretation in the national context, leading to the design of the principles, criteria and indicators to be monitored in the SIS, the interpretation and comments on the results and synthesis of the field work in the framework of the SESA, and the development of the GRM. The group further supported a review to improve strategic options and REDD+ activities as well as the institutional arrangements to allow for proper implementation, and suggestions of methodologies for the identification of project-affected populations (PAP) and vulnerable populations. Similar to the Carbon Methodological Group, it has not yet been formalized but remains a fully functioning group that meets according to the needs expressed by the BNC REDD+ for specific thematic guidance with participation on a volunteer basis.

Throughout the preparatory studies, consultations were held with a wide range of actors and institutions in the ER-P zone from various sectors and scales of interventions (members of village communities, administrative authorities - *fokontany*, communes, district and regions - and STD officers). In addition, capacity-building activities were carried out on an ongoing basis to better engage relevant stakeholders, including civil society organizations, and enable them to own the REDD+ mechanism on a more permanent basis.

The following table summarizes the consultations carried out.

Table 7: Consultations with stakeholders

Thematic of consultation	Groups consulted	Dates	Consultations' contents and issues
Consultations of entities related to ER-P management	PFN REDD+	September 21 and 22, 2016	Initial proposal of strategic options and activities and presentation of future improvement steps (through the various studies) Initial identification of activities and interventions for the ER-P based on the expert opinion of the National REDD+ Platform members
		December 14 and 15, 2016	Recommendations on the institutional arrangements for ER-P management. Refining of ER-P activities.
		January 30 and 31, 2017	Improvement of ER-P national policy options and activities Reflection on the implementation framework and the articulation between the monitoring tools (SIS, GM, NFMS) Development of the initial outline for the institutional arrangements for decision-making, implementation and monitoring of activities. Initial discussions related to the ER-P benefit sharing mechanism.
		February 22 and 23, 2017	Improvement and prioritization of ER-P activities Detailed description of some of the institutional arrangements.
		April 04, 05 and 06, 2017	Detailed description of the institutional arrangements as a whole and in-depth reflection on the monitoring tools: SIS, MRV/NFMS, revenue sharing mechanism.
		May 02, 03 and 04,	Refining all elements of the ER-P before submission of the project proposal.
		PFR REDD+ (for the 5 ER-P Regions)	November/December 2016
April 2017	Presentation of the ER-P according to five main topics: (i) Overall concept of the ER-P, baseline and principle of performance-based payment, (ii) Drivers of deforestation and forest degradation in the accounting area and ER-P activities and interventions, (iii) institutional arrangements for decision-making and implementation of activities, (iv) environmental and social safeguards and grievance redress mechanism, and (v) principle of benefit sharing.		

	GMC	May 2016	Creation of the GMC following a methodological workshop organized with all REDD stakeholders in Moramanga in April 2016, which allowed for defining the methodologies of forest and ecological inventories in the secondary and degraded forests in the ER-P zone.
		October 20, 2016	Progress status of national REDD+ preparation and ER-P development activities Methodological approach for improving the ER-P delineation
		January 18, 2017	Relationship between national strategic options and ER-P activities Institutional arrangements necessary for the proper implementation of the activities.
		March 13 14, 2017	Finalization of MRV/NFMS institutional arrangements
	REL Technical Group	February 14, 2017	First meeting of the group and presentation of the stakes and the group's working steps for the development of the ER-P's Reference level
		February 2017	Evaluation and recommendations on the methodology for calculating REL Analysis of spatial image data to estimate the level of degradation, as an exercise
		March 2017	Validation of the results of the tests carried out on the exercise data Assessment of the first deforestation maps established by the service provider
		April 2017	Assessment and recommendations for improvement of deforestation, degradation and carbon stocks maps, and ensuring consistency with inventory data
	GTS	September 28, 2016	Meeting to revitalize the Technical Group on Safeguards created for the R-PP preparation phase progress status of activities related to the national REDD+ preparation and ER-P development
		November 04, 2016	National clarification and interpretation of the Cancun Safeguards Presentation of the results of the SESA methodologies and development of the grievance redress mechanism
		January 18, 2017	Relationship between national strategic options and ER-P activities Institutional arrangements required for the proper implementation of the activities.

		February 07, 2017	Restitution of results from: - surveys in communes on priority environmental and social issues (SESA) - public consultations at the regional level on improving strategic options
		April 07, 2014	Methodology for identifying project-affected populations and vulnerable populations
Consultations in relationship with the preliminary studies for ER-P development	Analysis of the drivers of deforestation and forest degradation	September/October 2016	Municipal consultation (households and resource persons), followed by a restitution and consultation workshop in the ER-P regions National Restitution Workshop that provided additional critical information and further refinement of the analysis.
	SESA	September/October 2016	The SESA was carried out through several consultations: (1) national launch workshop to inform on the SESA, to identify national experiences (environmental and social issues) and to validate the consultation plan (2) village and commune-level consultations to prioritize environmental issues, improve Strategic Options of the National Strategy under development and identify activities; (3) consultations at the regional level to identify environmental impacts and recommendations for safeguard measures.
		5 th of July 2017	National workshop for presentation of the SESA and the Environmental and Social Management Framework (ESMF), the Process Framework (PF) and the Population Resettlement Policy Framework (PRRF) to the PFN REDD+ and representatives from all regions that were consulted before. This final workshop allowed BNCR to receive some final recommendations from all stakeholders.
	Design of the FGRM	August/September 2016	The development of the FGRM required several consultation steps: (i) at the national level through surveys of natural resource managers and civil society organizations and officers at sectoral ministries that can be involved in REDD projects (ii) community and village-level consultations: the stakeholders surveyed include all institutional actors (project promoters, administration and CTDs, local authorities, economic operators, NGOs) but also local communities, forest-dependent communities, traditional authorities, mayors and other municipal officials, fokontany, community-based organizations, farmers, etc.

		6 th of July 2017	National workshop for presentation of the FGRM to the PFN REDD+ and representatives from all regions that were consulted before. This final workshop allowed to receive some final recommendations from all stakeholders.
	Review of the political economy of deforestation and forest degradation	February/March 2016	Consultation with NGOs and ministries at the central level and consultations at the regional and local community levels with institutions working in environmental management.
	Collection of socioeconomic, sociopolitical, sociocultural analysis elements and on regulatory reforms for REDD+	August / September 2016	Consultation in the 151 communes of the ER-P on stakeholder's vision and perception of the current situation and future change scenarios for their landscapes and the role to be played by REDD+

The findings of the consultations on the preliminary studies for the development of the ER-P are disseminated through consultation reports validated by the BNC REDD+ and uploaded on the MEEF and BNC REDD+ website (www.bnc-redd.mg) in electronic format. The findings of the consultations are also shared and discussed at various meetings, platforms and the thematic groups.

b. Dissemination of information and access to information

A national REDD+ communication strategy was developed for Madagascar with the participation of stakeholders from December 2016 to April 2017 through local consultations, workshops and meetings at different levels. The overall objective of this strategy is to “promote stakeholders’ participation in the REDD+ mechanism”.

To date, the dissemination of information on the development of the ER-P has been carried out through several communication channels:

- Communication to the ministries and departments of the Government of Madagascar and Parliamentarians (MPs) is carried out with the support of the Minister of the Environment, Ecology and Forestry, the Coordinator of BNC REDD+ and members of the BNC REDD+;
- Meetings, workshops and awareness-raising campaigns have been organized by BNC REDD+ in five regions of Madagascar to inform and sensitize the various stakeholders on the progress of the ER-P (see table above);

- Meetings to present and validate study findings were organized in the ER-P regions in Madagascar (see previous table);
- Use of existing media: interviews and press releases are used to frame and disseminate information and messages related to REDD+ and ER-P. A training was provided to environmental journalists to update them and to promote a partnership in supporting the ER-P, and additional sessions are planned for November and December 2017. A televised debate on REDD+ in Malagasy language was organized and aired on a National Television station during the "Madagascar REDD+ Academy" in October 2016 and provided an opportunity to disseminate and share information on the progress of the REDD+ process as well as the preparation of a large-scale program in Madagascar.
- Communication tools specific to the BNC REDD+ have been developed:
 - ✓ REDD+ Newsletter for Madagascar (www.ecologie.gov.mg): The newsletter was developed in early 2017 with the objective of maintaining a dynamic link with the public and stakeholders. This quarterly newsletter serves to disseminate information on progress and events. The first two issues report mainly on the progress made in the national preparation phase, and addressed as well the ER-P and the forthcoming perspectives from the BNC REDD+.
 - ✓ BNC REDD+'s website: The website (www.bnc-redd.mg) was created in March 2017 and is currently being finalized. It has a pivotal role in the communication for the promotion of REDD+ in Madagascar and of the ER-P more specifically. Its objective is to facilitate access to information and documents at all times, with the data being periodically updated. Moreover, it will have an international scope, which is fundamental to develop the ER-P and to attract additional financing and investments for activities within the jurisdiction. It should be noted that so far BNC REDD+ has used the website of its line Ministry (www.ecologie.gov.mg) for information dissemination.
 - ✓ Social networks: Information (news, calls for tenders, etc.) is currently conveyed through the Ministry's Facebook account ([Meef Madagascar](https://www.facebook.com/MeefMadagascar)). The BNC REDD+ plans to create its own social networking account (Facebook or other) soon.

It should be noted that one of the central roles entrusted to the Civil Society Organizations (CSO) is to support disseminating information and mobilizing all stakeholders at national and regional levels .

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

Through consultations with the Regional REDD+ Platforms, the National REDD+ Platform, the Technical Groups and CSOs, BNC REDD+ has been able to gather a large amount of relevant feedback that it will continue processing over the next few months. The following table summarizes the main

recommendations and feedback (that were mentioned several times in the different workshops) from stakeholders, as well as proposals for action and solutions to resolve concerns and stakeholder expectations by the time the ER-P development process is completed.

Table 8: Summary of mains concerns and recommendations expressed by stakeholders, and their incorporation within the ER-P development

Theme discussed	Concerns, comments, potential risks mentioned by stakeholders	Incorporation or next steps
General concept of the ER-P	It might be complicated for the program to ensure carbon stock enhancement on forest fallow lands. They are traditionally used for agricultural rotation and never aimed at becoming secondary forest.	Activity AD2 was modified in order to ensure that it would aim at ensuring that permanent crops with high value will be implemented on forest fallow land when possible and ensure the formation of a forest cover and promote agroforestry system as an alternative to traditional rotational agriculture.
	For some stakeholders, REDD+ is a new and very complex mechanism compared to usual projects implemented in Madagascar. Also, in order to ensure the efficiency of the program and the participation and engagement of stakeholders, strong effort will have to be made for capacity building and information sharing at all level.	During the next months and the improvement of the ER-P design, BNC REDD+ will continue to ensure that regional and central entities responsible for the program will receive the necessary capacity building. However, during the implementation phase, and to ensure participation and engagement of local stakeholders, the Technical Supporting Staff (TSS) of each BRC REDD+ (see section 6) will play a key role in supporting stakeholders at sub regional level, providing a continuous and "learn-by-doing" capacity building.
	The REDD+ mechanism and the program won't be able to reach their objectives without a financial and strong implication of other sectors responsible of deforestation.	The cross sectorial approach was systematically at the center of attention when designing the ER-P. The willingness to have entities such as the COPIL-REDD+, the PFN REDD+ and the PFR REDD+ is a concrete proof of it. However, and as explained in section 4.3, activities of the program have been defined so far according to needs identified by stakeholders but no real partnerships or action plan were designed between MEEF and other sectoral ministries. The next months will be dedicated to this precisely.
Drivers of deforestation & Activities of the	Something that does not appear in the drivers analysis is the negative effect of invasive species on natural forest.	BNC REDD+ is currently trying to identify the potential link between deforestation and invasive species, and if a clear link will be identified (in the accounting area), the program will have to include

Program		some dedicated activities in order to tackle such additional causes of deforestation.
	The non-enforcement of laws and related sanctions are an important handicap for ensuring a sustainable management of forest. The program needs to tackle that.	Activity FI1 had been created in order to focus specifically on this aspect.
	Limiting the access to natural resources by local population without offering economic alternatives won't allow a sustainable management of forest and will generate displacement of activities	This critical issue explain why when designing the institutional arrangements of the program, an important attention was given to ensure that local stakeholders need to be in charge of planning their activities.
	Stakeholders don't have enough capacity to implement REDD+ activities	The TSS team of each BRC REDD+ will be in charge of ensuring that stakeholders will have enough capacities to implement REDD+ activities, or to identify other entities able to.
	Activities of the program should not focus too much on increasing revenues of local population but rather on improving their well-being, including by ensuring a sustainable access to natural resource.	This recommendation has been taken into account when developing the vision for non-carbon benefit (see section 16).
	Activities suggested for reducing deforestation have to be planned at local level.	Institutional arrangement was designed to do so (see section 6.2)
	Natural and extreme climate events could have an impact on deforestation thus the program needs to ensure that there is a system to compensate the potential loss of emission reduction	The reversal analysis does integrate this risk, and 3% of emission reduction will set-aside in a buffer.
Institutional arrangements	Institutional arrangement is very heavy and it might require a lot of time only to take one decision.	This one important issue that BNC REDD+ with PFN REDD+ and PFR REDD+ will have to work on. Rather than modifying the global scheme, the objective is to define procedures that could facilitate the decision-making process.
	Sometimes some local decision-making structure already exist and only need to be trained in order to be operational for the program	The ER-P will have to incorporate this possibility but one general idea is to use what is already existing rather than reinvent the wheel. But this is something that will be managed case by case.
	All planning tools and plans (SAC, SRAT, PCD) will have to be updated according to REDD+ activities.	This has been added in the institutional arrangements (see section 6.2) and in activities FI1.

Environmental and social safeguards and Feedback and Grievance Mechanism	The type of compensations when relocation of population or restriction of access to natural resources occur needs to be defined not on a standardized way but according to local specificities	It won't be the case because each project with potential impact will have to develop a specific Resettlement Plan (PAR) in line with local specificities (see section 14.1).
	A specific committee for grievance mechanism is necessary at each level, and the different instances involved need to be trained for this role.	BNC REDD+ is currently working on this sensitive issue in order to ensure that each level will have the necessary instances and committee to ensure effectiveness of the general grievance mechanism.
Benefit Sharing mechanism	Prioritization criteria for activities planning need to be (well) defined in order to ensure equity when distributing revenues	These criteria have been developed and will be improved during the following months (see section 15.2)
	It is important to manage the "reward" system in order that it couldn't create local conflicts of interests.	In order to reduce these risks of conflicts, the allocation of "rewards" fund will be negotiated initially during the project design in order to ensure the participation of all stakeholders (SLC) (see section 15.2)
	The benefit sharing mechanism shouldn't be based only on performance but also on the effort provided to implement planned activities aimed at reducing deforestation.	This is something that has been added to the reward system (see section 15.2), however BNC REDD+ will have to develop specific procedures to clarify this in detail.

6. OPERATIONAL AND FINANCIAL PLANNING

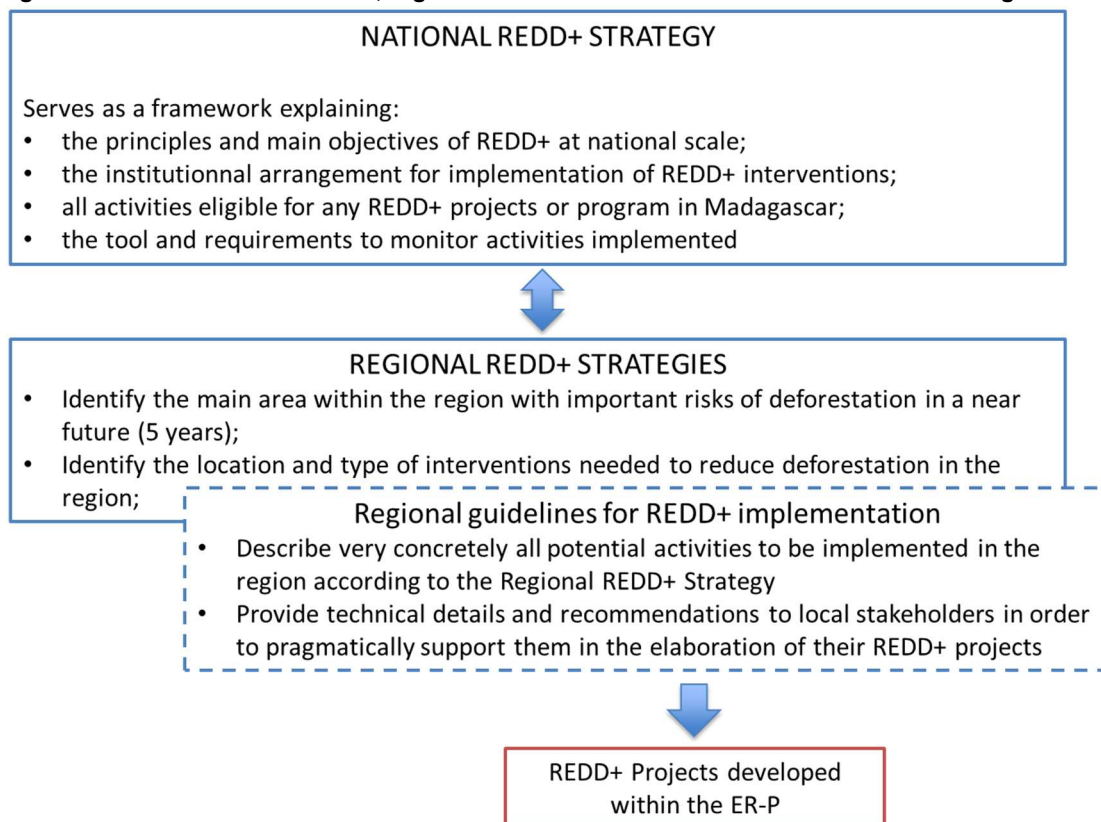
6.1. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

The Government of Madagascar will be the signatory of the ERPA and will be represented by the Ministry of Finance and MEEF as the Legal Entities for the Emissions Reduction Program. In this capacity, the MEEF authorizes the BNC REDD+ to administer and manage the Emissions Reduction Program. The overall responsibility for the development of REDD+ in the country rests with the BNC REDD+, on behalf of the MEEF, as the entity implementing the ER-P from an operational point of view, but also as the entity liable to the Carbon Fund.

The overall design of the ER-P is based on the following principles for the operationalization of activities:

- During the reinvestment phase of carbon revenues, REDD+ activities categorized in section 4.3 will be implemented through “REDD+ projects” developed by local stakeholders;
- Regional REDD+ Platforms will have to define a Regional REDD+ Strategy, in line with the National REDD+ Strategy, identifying the priority areas and group of potential interventions to be implemented on the part of the region included in the ER-P. In accordance with the REDD+ Regional Strategy, the Regional REDD+ coordination office (BRC REDD+) will be in charge of developing a concrete REDD+ Implementation guide for local stakeholders in charge of designing the more detailed “REDD+ project”. Stakeholders participating in project development will have to show in their proposal how their proposed activities will reduce deforestation and degradation, and that their project is in line with the orientations provided by the Regional REDD+ Strategy;
- Activities eligible under the Regional REDD+ Strategy may be implemented simultaneously within a project for several communes in accordance with the landscape approach (“Inter-communal REDD+ projects”), or in a single commune (“Communal REDD+ projects”). The ER-P provides for the possibility to implement projects that go beyond regional administrative boundaries, under the name of “large-scale project”, and deriving directly from the National REDD+ Strategy;
- The implementation of these “REDD+ projects” will need to ensure that there is a clear reduction of deforestation and/or degradation, or carbon sequestration. Activities planned within REDD+ projects will be integrated into regional land use plans (SRATs) and communal land use schemes (SACs).

Figure 11 - Link between national, regional and local REDD+ framework documents and guidelines



The ER-P is underpinned by an **evolving approach** as described below:

- During the first two years, ER-P activities will be largely based on contributions of existing projects and organizations (PADAP, CAZ, Makira, MNP, etc.), potential private investors (BNC REDD+ is conducting preliminary feasibility surveys to identify 4-5 agribusinesses value-chain blueprints and identify private operators to invest in such agribusinesses) But this pre-financing will only cover part of the communes concerned by the ER-P, and Madagascar and BNC REDD+ will intensively seek additional up-front investments in order to increase the performance of the program and the amount of carbon revenues used for the next steps.
- Over time, carbon revenues earned will be distributed to ensure: (i) the continuation of existing REDD+ projects previously started and whose performance has been effective and verified as part of the ER-P (in this case carbon revenues will be dedicated to maintain and ensure the project 'objectives, but not by repeating exactly the same activities but by implementing complementary activities, to be considered as a "second step" or the continuation of the REDD+ project) , (ii) the spatial or thematic expansion of existing and ongoing REDD+ projects whose performance has been verified as part of the ER-P, or (iii) new REDD+ projects in new areas, whose potential impacts will have to be proxy-estimated ex-ante. The financing of activities of each REDD+ project deemed to be additional or supplemental must be considered by the providers and beneficiaries as an "advance payment for performance". Thus, within a REDD+ projects, activities receiving

financing from the ER-Program will not be eligible for an ex-post results-based payment. Rather, for the majority of funds paid to the program, new activities (through a new REDD+ projects or within existing REDD+ projects if activities are deemed to be additional regarding the previous phase of activities) or the expansion of existing activities will be prioritized.

- At the end of each REDD+ project, a reward system will allow for a final payment (considered then as the final step of the REDD+ project, to be implemented conditionally as explained in more detail here after) dedicated to the implementation of activities that do not necessarily generate ERs but have a social and incentive scope (like social infrastructure). Conditionality criteria for this payment are under development but will be based on (i) performance in terms of reduction of deforestation estimated with proxies, and (ii) efforts provided by stakeholders to implement the REDD+ project and its activities.

a. *Governance, planning and decision-making processes*

At sub-regional level

i. At the commune level

A **Local Consultative Structure** (SLC) will prioritize REDD+ activities proposed by relevant actors at the local level (VOI, groups and federation of farmers, farmers' groups, small miners, private sector, etc) and design REDD+ projects.

The SLC is an official structure regulated by Decree n ° 2105-957 that establishes procedures for the application of Article 15 of the Law n ° 2014-018 dated September 12, 2014 on the jurisdiction, organization and operation of the decentralized jurisdiction or CTDs (Provinces, Regions, Communes). This structure also brings together representatives of economic operators, civil society organizations, notables and traditional leaders, local political parties and organizations, associations of women, youth and vulnerable groups, and existing consultative frameworks (art. 8). The representatives of the *Fokontany* are ex officio members at the commune level.

With regards to the ER-P, the mission of the SLC will be to stimulate dialogue, coordinate stakeholders and prioritize actions under the REDD+ umbrella. Eligible REDD+ activities will be described by the Regional REDD+ Strategy and in detail by the “Regional Guidelines for REDD+ Implementation” that will be available in local dialects; these guidelines will describe: (i) eligible activities; (ii) implementing practices and methods; (iii) monitoring criteria (ER proxies, safeguards, etc.); (iv) estimated costs; (v) implementing partners (this point is fundamental to avoid disadvantaging some actors against others and ensuring equity); (vi) direct and indirect beneficiaries of monetary as well as non-monetary benefits.

The **Municipal Council** will validate the proposals of the SLC, and will incorporate these into the Communal Development Plan. The **Mayor** (and his/her **Executive Committee- ECM**), as the Project Owner, will oversee the activities to be carried out.

ii. At the intercommunal level

Commune-level **Local Consultative Structures (SLCs)** that are close in proximity to each other and that belong to the same landscape or watershed may come together to form an **Inter-commune Platform (PLI)**, whose main tasks will be to: (i) seek consistency of priorities at the landscape scale based on proposals made by the communes concerned, and in relation to the Regional REDD+ Strategy (the PLI will not only have to "select" the relevant proposals from communes but also harmonize them across communes); (ii) arbitrate intersectoral divergences at the landscape level; (iii) coordinate emergency measures at the landscape level; and (iv) facilitate the integration of REDD+ activities into the SRATs. Its secretariat will be ensured by CIREEF.

At the regional level

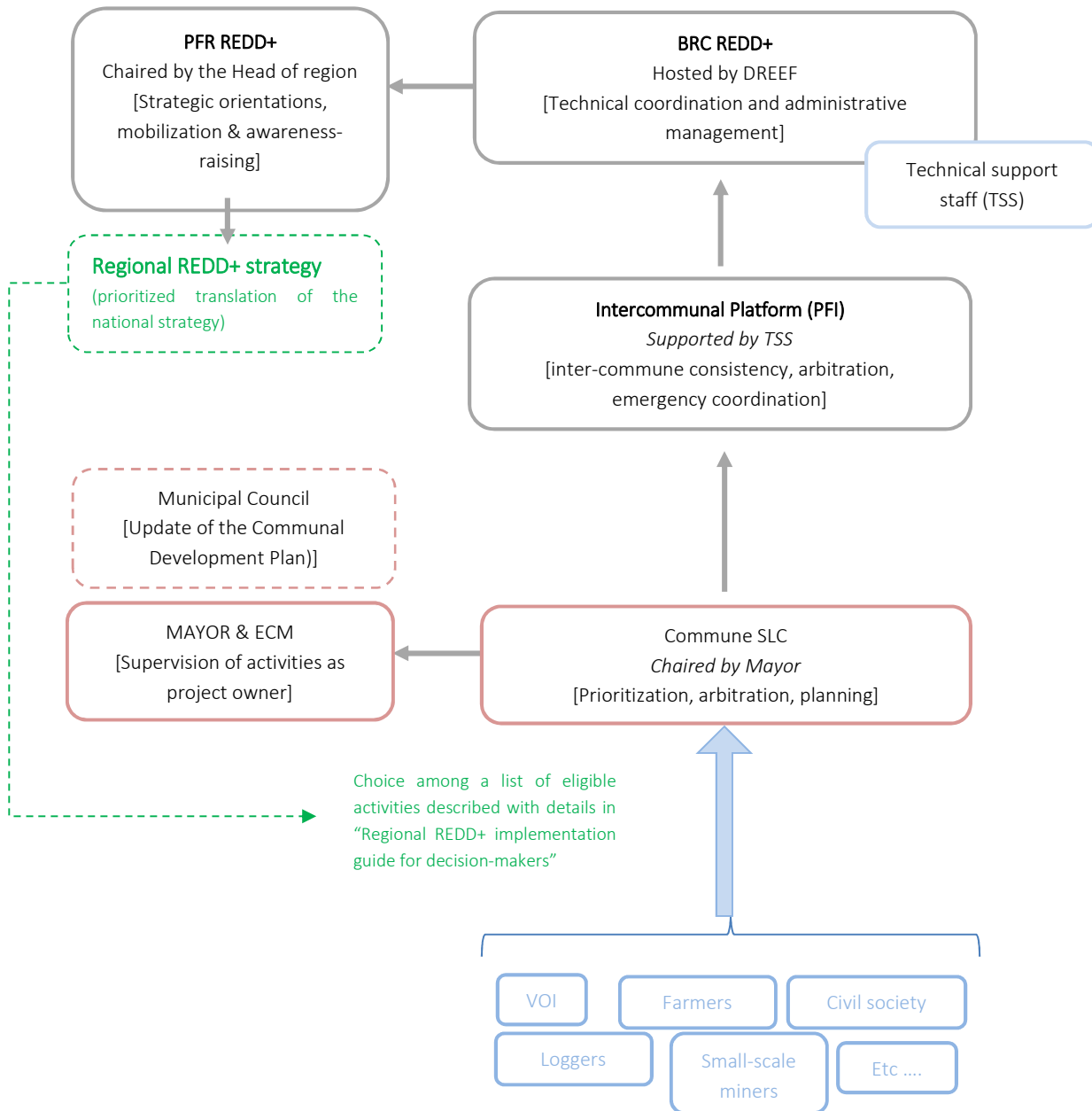
The **Regional REDD+ Platform (PFR REDD+)**, chaired by the Head of Region, will perform the same functions as the National REDD+ Platform, but at the level of each region. The PFR REDD+ consists of the Forestry Commission expanded to include actors who have volunteered to be part of this body and to ensure that all REDD+ stakeholder groups are represented. In particular, the PFR REDD+ will ensure: (i) the translation of the National REDD+ Strategy into a Regional REDD+ Strategy according to local priorities; (ii) mobilization and awareness-raising of stakeholders and sectors for the development of regional regulatory texts required by the ER-P; (iii) calls for action in case of emergencies. The PFR REDD+ will meet every two months and ad hoc meetings can be convened as required and as proposed by the BRC REDD+.

The **Regional REDD+ Coordination Office (BRC REDD+)** will be hosted by the DREEF and will be staffed according to regional needs, while limiting operating costs. Its main functions will be to: (i) coordinate and monitor REDD+ activities in the region; (ii) consolidate plans and reports on REDD+ activities; (iii) collect information/data on ER-P activities.

The BRC REDD+ will host a dedicated team, namely the **Technical Support Staff (TSS)**, consisting of a REDD+ technician who will visit PLI and SLC to support them in planning, monitoring activities, writing reports, organizing and facilitating meetings and workshops.

The following diagram shows the governance arrangements at the regional and sub-regional levels:

Figure 12: Governance scheme at regional level



At the national level

A REDD+ Steering Committee (COFIL REDD+) will be the political and strategic decision-maker for the REDD+ mechanism in Madagascar, as well as for legal, operational and financial implications of the ER-P. As an entity, COFIL REDD+ will not formulate policy and strategic orientations but will grant final approval

and/or suggest modification to the orientations developed and issued by the PFN REDD+. The COPIL REDD+ will meet twice a year to monitor the progress of REDD+ and ER-P activities, and can hold ad hoc meetings in response to requests by the PFN REDD+ with support from BNC REDD+. The final nomination of participants is being clarified and will likely be the reactivated Interministerial Environmental Committee (CIME⁶⁹ by its acronym in French).

The **National REDD+ Platform (PFN REDD+)**, chaired by the General Secretary of the MEEF, for which the secretariat is provided by BNC REDD+, is the most important and central body of the REDD+ mechanism. It is in charge of developing and formulating specific proposals on the following aspects (to be submitted for the COPIL REDD+'s approval), among others:

- National and ER-P-related strategic orientations and plans: National REDD+ Strategy, ER-P activity reports and plans, etc.;
- Legislation and regulatory texts specific to REDD+ (orders, decree, etc.);
- Crisis and emergency management.

The PFN REDD+ is made up of representatives for all key REDD+ stakeholder groups and meets monthly and in response to special requests by the BNC REDD+ (in the event of urgent matters, for example).

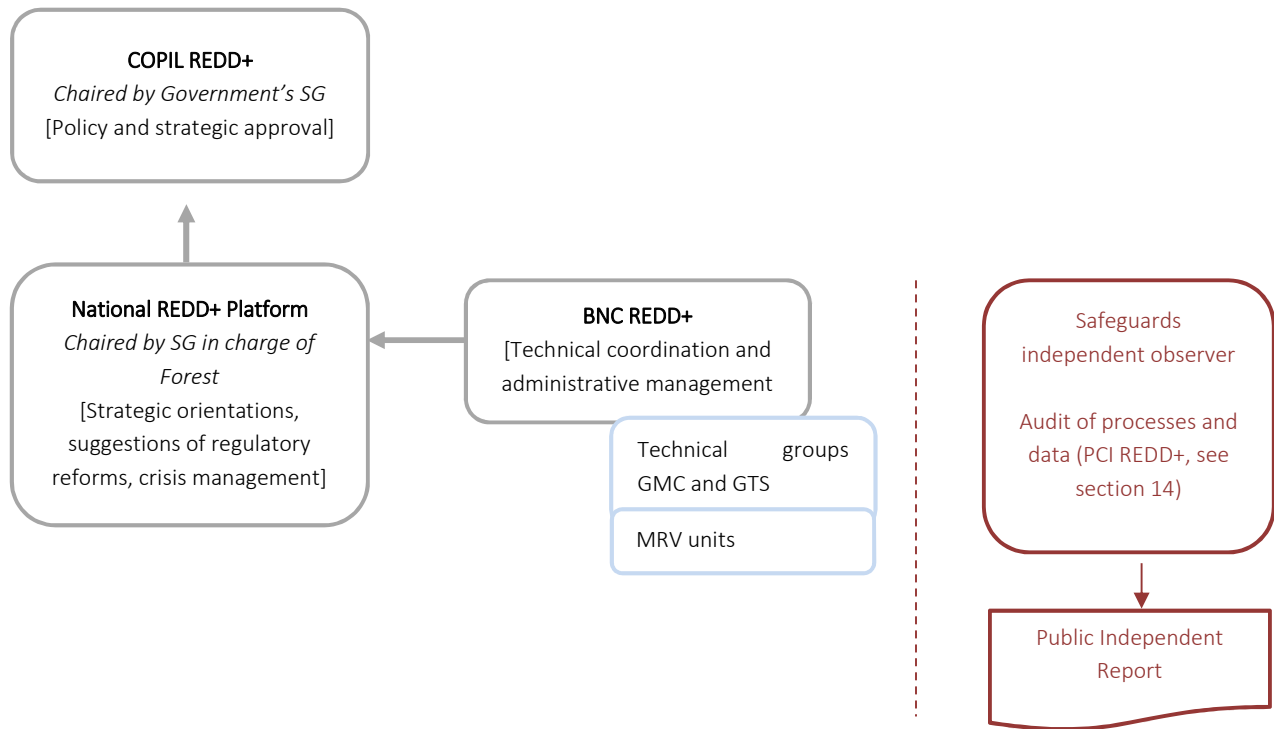
The **National REDD+ Coordination Office (BNC REDD+)** was created by [Ministerial Order No. 21718/15-MEEMF](#) in February 2014 within the Ministry of the Environment, Ecology and Forests to ensure ownership and coordination of the REDD+ process at the national level and ensures the secretariat of PFN REDD+. It is not designed to be in direct relationship with the COPIL REDD+ (except for ensuring secretariat duties). The BNC REDD+ will administer and manage the ER-P as a whole and will ensure proper coordination of activities. In addition, it is in charge of compilation of technical and financial report, daily administrative management, management of the SIS and GRM databases, and management of the national forest carbon registry, in close collaboration with other entities working on carbon registries. It will host the MRV unit linked to the NFMS, and will organize the meetings of technical support group (GMC and GTS) for the supervision of studies and technical prospects.

An **independent observer on safeguards**, that is not yet identified at this stage, will be mandated by COPIL REDD+:

- It will be an entity that is not involved, directly or indirectly, in the implementation of the ER-P.
- Its mission will be to perform an "independent audit" of the quality of data and processes related to safeguards and to issue a "public and objective" report that will be incorporated in Madagascar's communications to the UNFCCC and the FCPF.

⁶⁹ Created by the « Décret n° 95-607 du 10 Septembre 1995 portant création et organisation de CIME ». The main objective of this entity is to ensure the incorporation of environmental requirements in sectoral development plans.

Figure 13: Governance scheme at national level



National planning and decision-making processes are intrinsically linked to the benefit sharing mechanism (see section 15), and as such have been developed as a mix of a top-down process for the general approach and identification of priority areas (through the National and Regional REDD+ Strategies) and a bottom-up process for the choice of activities and design of REDD+ projects to implement.

Top-down process:

- At each stage of the generation of ERs (and therefore carbon revenues), the PFN REDD+ will have to draw up an ER-P Investment Plan that will specify the distribution of budgets between: (i) “large-scale projects” to be expanded and maintained; (ii) new-large scale projects, and; (iii) regions of the ER-P according to a certain number of criteria (see section 15). The document prepared will be relatively brief in length and will provide general orientation based on priority issues related to deforestation and, at the same time, seek equity to the extent possible in the allocation of financial resources across regions and stakeholders, by including selection criteria specifically focused on poverty reduction and inclusion of vulnerable or marginalized stakeholder groups. *These criteria will be improved and developed in more details with support of the PFN REDD+ and the PFR REDD+ stakeholders, during the next meetings planned in October 2017.*
- The Regional REDD+ Platform, whose administrative and technical secretariat is provided by BRC REDD+, will be in charge of developing the Regional REDD+ Strategy in line with the National REDD+ Strategy, but providing more details on priority areas and interventions. For example, defining the prioritization of watersheds (landscapes) and communes (areas with major risks of

deforestation), and within these areas prioritization of activities by subareas (crests, slopes and low-lying lands, cf. section 15). Some degree of flexibility will be built in the system for communes to define activities to be implemented, described in detail in the Regional Guidelines for REDD+ Implementation. This guide will be drawn up by BRC REDD+ and TSSs and will provide following information:

1. A detailed description of the activity;
2. Identification of implementing practices and methods;
3. A description of monitoring criteria: proxy ERs, safeguards, etc.;
4. Estimated costs;
5. Identification of implementing partners;
6. Identification of direct and indirect beneficiaries of activity implementation, and allocation of monetary and non-monetary benefits.

Bottom-up process:

- On the basis of this Regional Guidelines for REDD+ Implementation, the designated SLCs will identify (with the support of the TSS) necessary interventions to reduce deforestation, and based on a budget ceiling (to be provided by the REDD+ PFR and the BRC REDD+), carry out a participatory mapping of the activities to be implemented. This information will be described in a REDD+ Projects Document, covering a maximum of 5 years.
- When priority communes for intervention are identified as being part of a same landscapes and watersheds, the PFIs will review (with the support of the TSS) all the commune-level REDD+ Projects Documents produced and will consolidate them so that the communes' administrative boundaries do not cause inconsistencies in the implementation of projects at the landscape level. For example, PFIs will be in charge of harmonizing reforestation zones between the communes. TSSs will be in charge of finalizing the REDD+ Project Document for the overall landscape, containing in annex all the commune-level REDD+ Project Documents initially proposed.
- All REDD+ Project Documents of a region will be consolidated at the BRC REDD+ level into a Regional REDD+ Activity Plan. This plan will prioritize all REDD+ projects according to an evaluation of a certain number of criteria (that are still being finalized) but that will be related to performance (carbon), equity, additionality, and perpetuation/continuity of activities (see section 15). This Regional REDD+ Activity Plan will be validated by the PFR REDD+ before being forwarded to the BNC REDD+.
- The 5 Regional REDD+ Activity Plans of the ER-P will be consolidated by BNC REDD+ into a Program Activity Plan and validated by the PFR REDD+ and then by the COPIL REDD+.

In order to facilitate the phased planning and validation of REDD+ Projects, some tools and methods have been developed with the PFN REDD+ but will need some further detailed procedures:

- All information necessary for local stakeholders to build REDD+ projects will be translated into pragmatic and technical language and procedural protocol. This task will be realized before the

beginning of the ERPA and is planned by BNC REDD+ once Regional REDD+ Strategies will be developed;

- All administrative tasks will be under the responsibility of BRC REDD+ and BNC REDD+;
- The TSSs will be staffed in order to ensure efficiency and provide adequate capacity building and support for local stakeholders;
- The Regional Guidelines for REDD+ Implementation will be translated into local dialects when needed;
- The design phase of REDD+ projects will be divided into several meetings moderated by TSS and using a standardized approach with thematic and phased working groups;
- Specific templates for REDD+ Project Documents will be designed to streamline the process, reduce complexity and length of the document required and reduce the workload for SLCs.

The five latest tasks are part of the operational budget of the program and thus is included in the budget of the program in section 6.2.

b. Operational arrangements for ER-generating activities

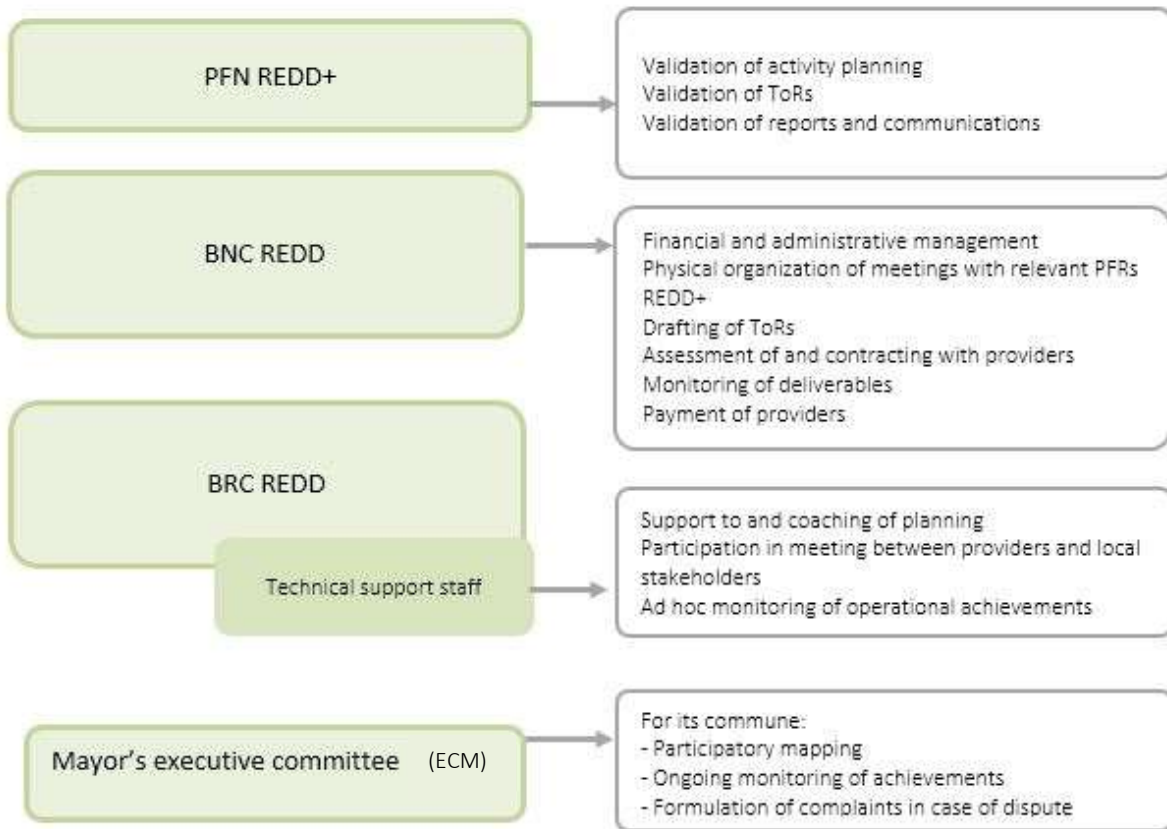
Once the REDD+ Projects are validated and carbon revenues made available, the project proponents and developers will initiate implementation. Regardless of the levels, this phase involves the following stages for the activities conducted by providers and stakeholders (exclusive of activities governed by the administration): (i) from formulation of terms of reference to contracting, and (ii) from monitoring projects to validation of their deliverables.

However, the actors involved in the operational system will vary according to the scale of application.

i. "Large-scale" projects

These activities, which will be implemented in the form of a project, may concern several regions, in a single zone or in several sub-zones. As such, while PFR REDD+ may be consulted beforehand, the operational and administrative management of implementation will be under the responsibility of the BNC REDD+ and under the supervision of the PFN REDD+. The BRC REDD+ concerned by the activities will play a support role in the planning and implementation of activities as well as in the ad hoc monitoring of the activity process.

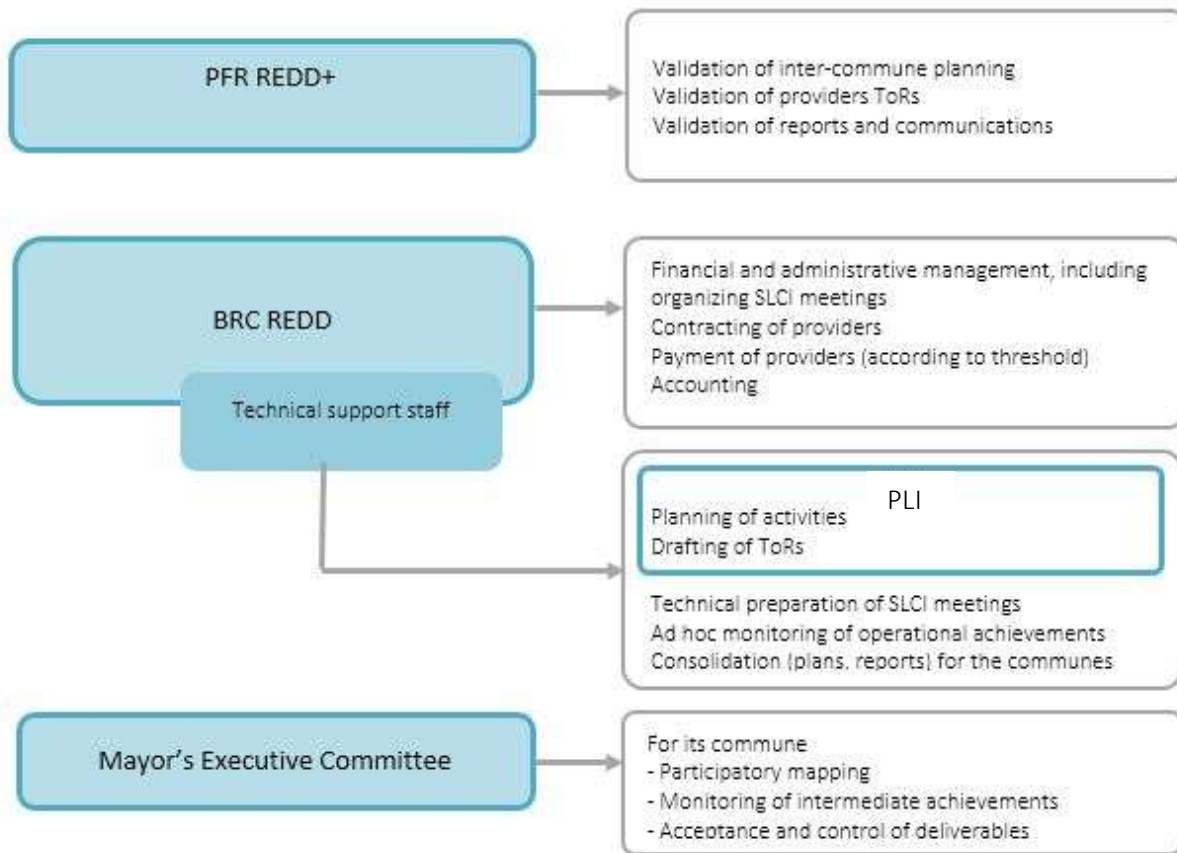
Figure 14: Operational arrangement for large-scale projects



ii. Intercommunal / landscape projects

For activities implemented at the landscapes and inter-commune levels, while PFR REDD+ and BRC REDD+ will play the role equivalent to those of PFN REDD+ and the BNC REDD+ under large projects. In this case the TSS will play the central role as it will be the direct intermediary between the stakeholders gathered within the PFI and SLC and the regional entities. The TSS is considered the catalytic body that ensures technical consistency and supports actors in the planning, implementation and monitoring of activities.

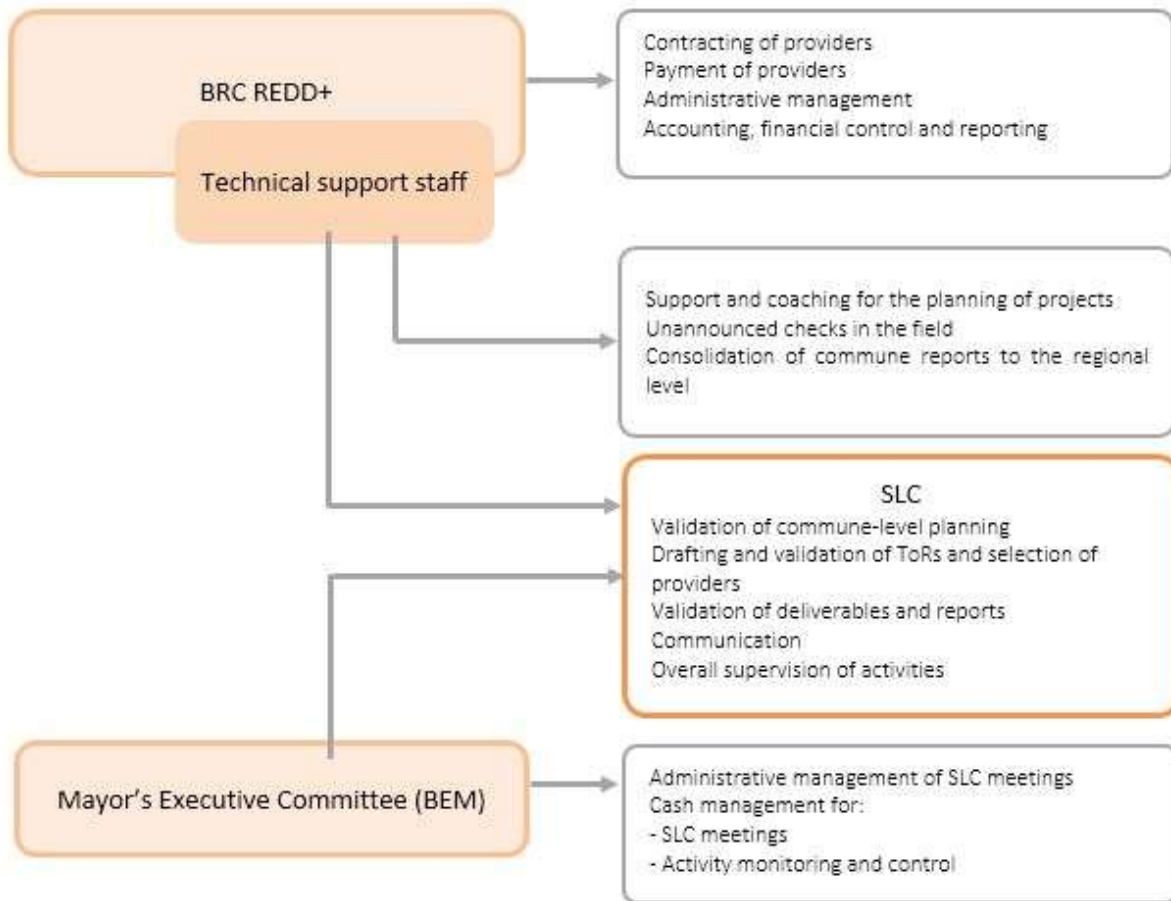
Figure 15: Operational arrangements for landscape projects



iii. Commune-level projects

For activities carried out within a single commune, the Mayor’s Executive Committee will play a more important role, particularly from an administrative point of view, since it will be in charge of organizing SLC meetings as well as monitoring and controlling activities, and verifying deliverables. However, as explained above, the SLC, with the support of the TSS, will oversee planning activities (with a spatial representation of activities based on a participatory mapping), the formulation of Terms of Reference and the identification of implementing providers, as well as the validation of deliverables and communications.

Figure 16: Operational arrangements for commune-level projects



c. Implementation of activities that do not generate ERs but have a social and incentive scope

Groups of communes and communes where REDD+ projects have taken place and where the monitoring of ER proxies have shown effective performance, will be entitled to a part of the project budget considered as a final payment or “reward” of the projects. The resources will be used to finance social and development activities and incentives for local populations. The resources will be used to address problems related to:

- Population growth (family plan, awareness-raising, etc.);
- Human health and the living conditions of local populations (hospital infrastructure, health clinics, markets for local products, etc.);
- Education, including environmental education;
- Sustainable economic development.

Planning and decision-making related to these activities will be done during project development and will follow specific procedures that will be defined in the coming months. This contractual way of incentivizing local populations is critical to ensure the efficiency and performance of each projects, and more globally of the program itself.

The different platforms meetings in November will allow to:

- Define the eligible activities to be funded by this reward system, in order to ensure consistency with REDD+ objectives;
- Define the amount of fund allowed for this reward, per REDD+ project, and the rules of calculation (Is it a percentage of the overall REDD+ project budget? It is fixed per project REDD+?);
- Define the criteria and rules of attribution: X% of the reward linked to performance criteria? Y% criteria linked to efforts provided?
- Define the process of allocation of this fund: who is in charge of ensuring the transparent use of this budget, of monitoring the implementation of the planned activities related to the reward? Is the budget transferred to a local fund? Etc.

d. Support activities for actors and stakeholders: training, workshops, ongoing support, etc.

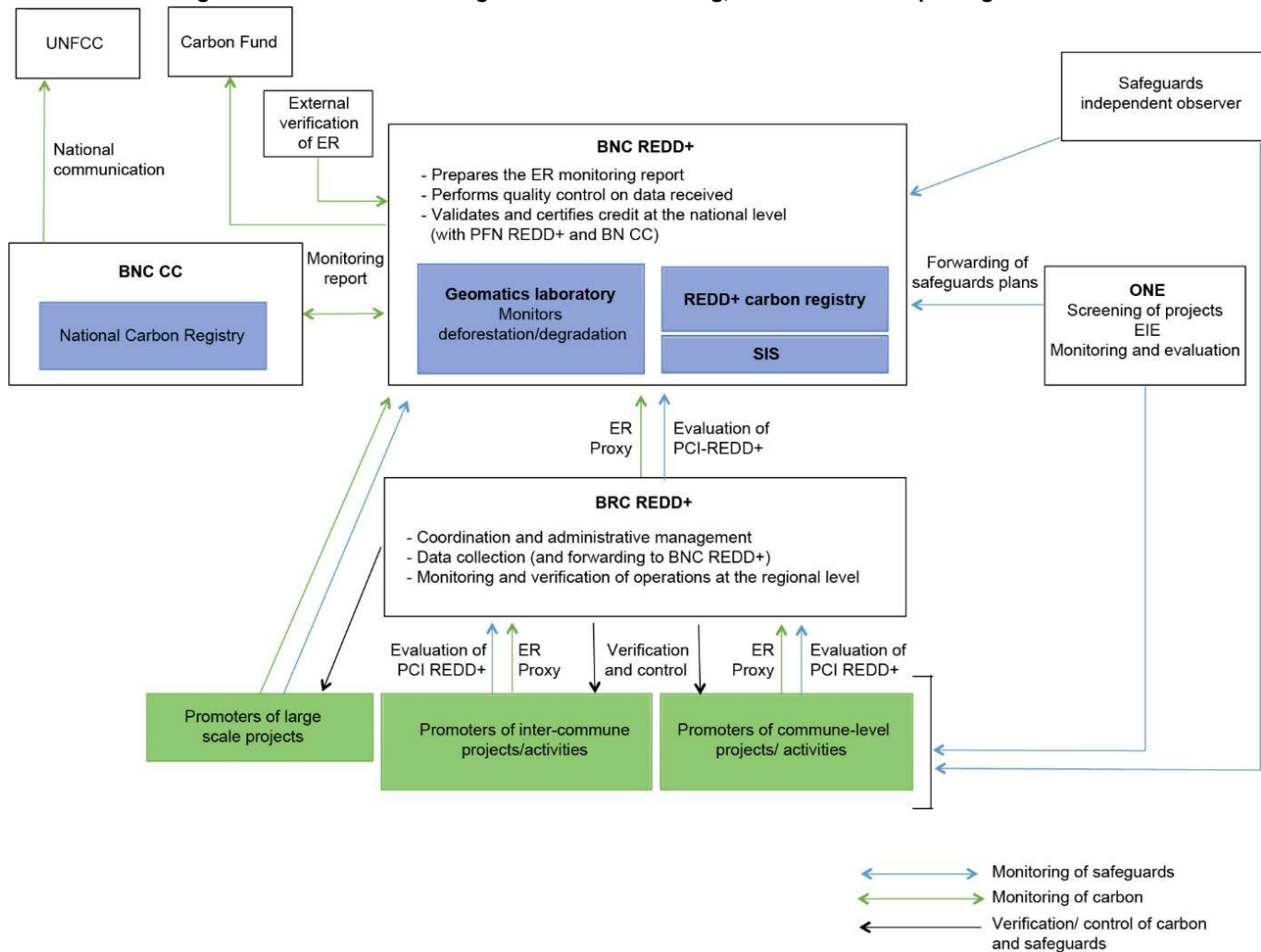
Although stakeholders have not yet clearly identified all of the decision-making and implementation processes for these activities, the ER-P will need to provide for training and workshops to ensure capacity-building of officers involved in the management and operationalization of the ER-P as well as the beneficiaries of activities at the local level. It should be noted that some of these activities are already considered as ER-generating activities with indirect impacts activities described in section 4.3. The other part of these support activities will likely have to be directly integrated into service contracts relating to each contracted project.

e. Monitoring, evaluation and reporting activities

As explained above, the activity reports will follow the same process as for the preparation of the activity plans, but will include the monitoring of the ERs (proxies) that will then allow for distributing revenues (see sections 15). The objective in doing so is to simplify coordination and avoid multiplying intermediaries at each level.

For the monitoring and evaluation of safeguards and emission reductions, please refer to sections 9 and 14. The following diagram summarizes the information, without detailing the exact processes.

Figure 17: Institutional arrangements for monitoring, evaluation and reporting activities



f. Institutional arrangements for administrative and financial management

Administrative management

At the national level, in order to streamline the management of the ER-P, all administrative aspects will be managed by the BNC REDD+. This includes the organization of meetings of COPIL REDD+, PFN REDD+, and technical groups.

At the regional level and for inter-commune and commune-level activities, all administrative aspects will be covered by BRC REDD+ (for activities at the commune level, this will be the case only beyond a budgetary threshold that will be set by PFR REDD+). This includes the organization of the REDD+ and PFI meetings.

At the commune level, part of the carbon revenues would be directly transferred to a Local Development Fund (LDF), whose governance (in relationship with the use of funds) will be ensured by SLC, and the

administrative management by the ECM (this aspect is still undergoing review and validation through a process of consultations). This fund will be dedicated to:

- SLC meetings;
- Field monitoring activities;
- Some ER-generating small-scale projects whose budget will not exceed a certain threshold to be set by the PFR REDD+ (beyond which BRC REDD+ will be in charge of administrative management).

Financial management

The various up-front investments planned under the ER-P (existing projects) are currently being implemented through institutional arrangements that are slightly different but not inconsistent with the structure presented previously. Thus, during the initial investment phase, and since some REDD+ institutions (like BRC REDD+) will be in the process of development and operationalization, the projects will integrate the institutional structure gradually, and all actors will have to comply with the ER-P institutional framework only at the first income distribution phase.

It is important to note that the ER-P might require some years before carbon revenues can supply sufficient support to cover program implementation costs. Given this likelihood, The Program will seek to attract additional investments from private sector and other technical and financial partners, and at the same time will seek to direct development and environmental project plans to concentrate efforts inside the Program area.

Figure 18 - General financial management process for REDD+ projects implementation within the ER-P

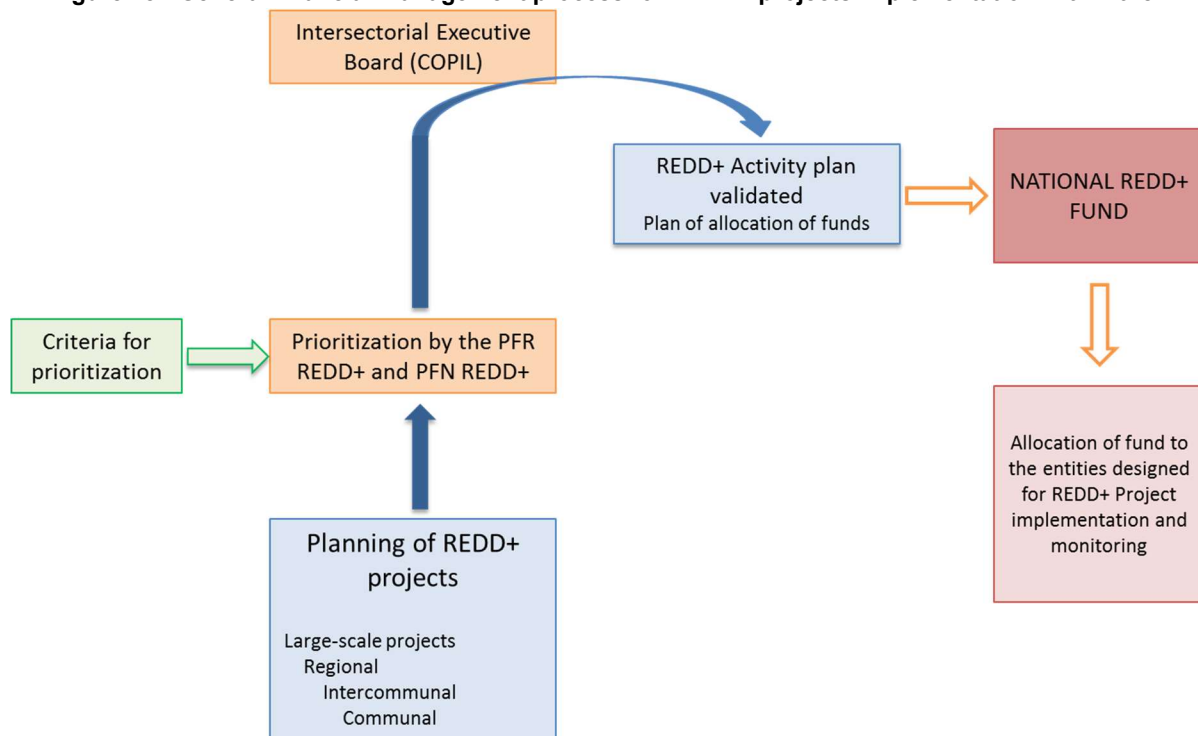
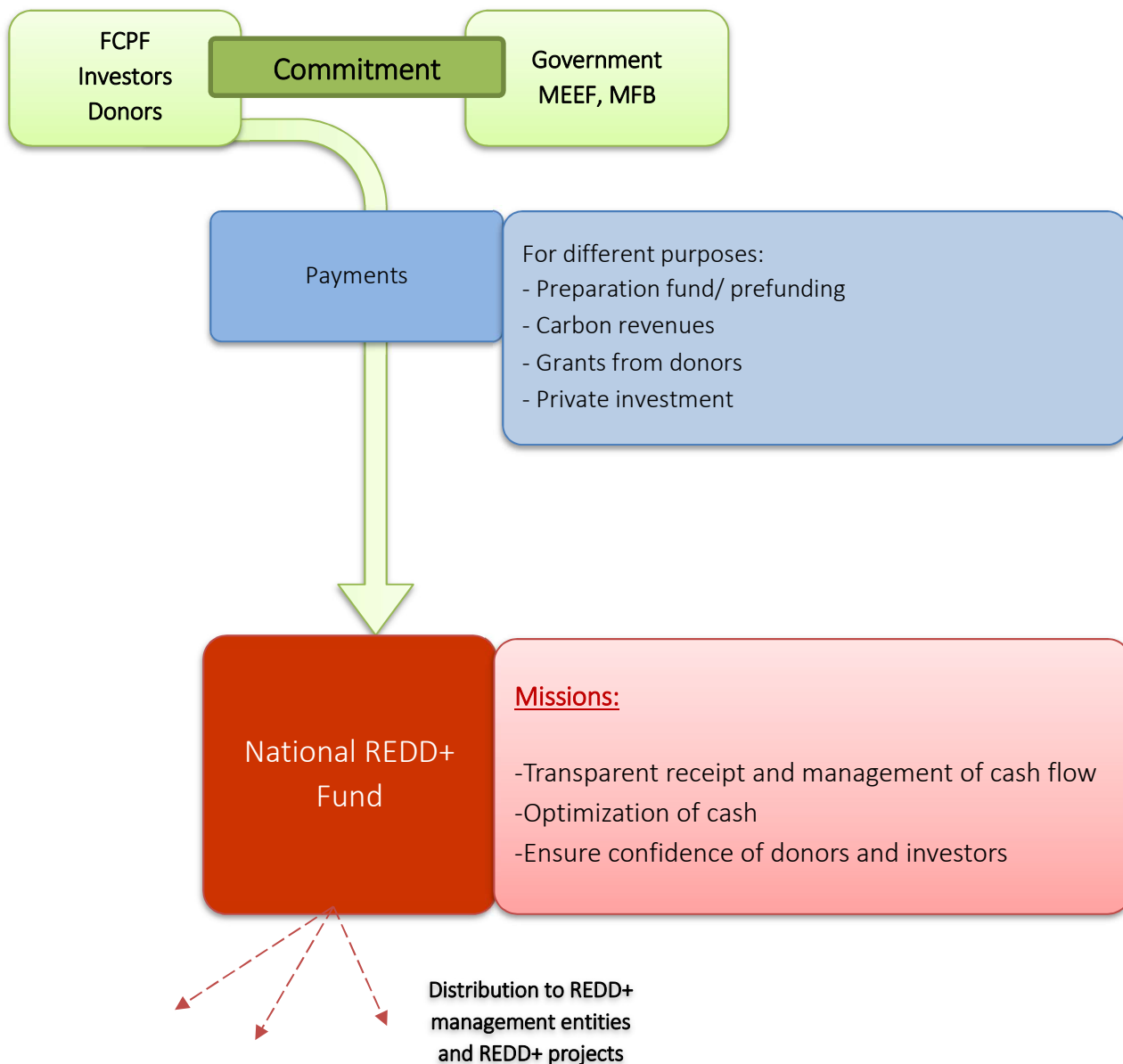


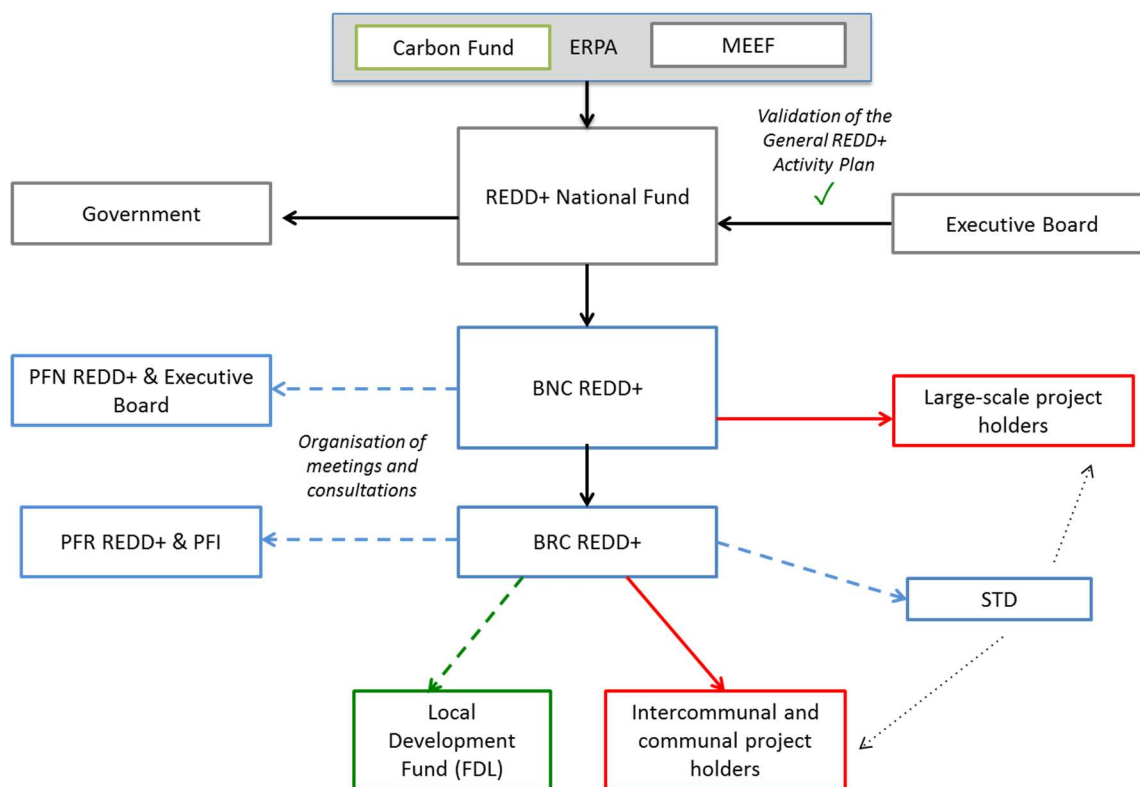
Figure 19: Financial flow general scheme



Financial flow and carbon revenues reporting will only be released when the General REDD+ Activity Plan of the program will be validated by the approval entity of the ER-P: the COPIL REDD+ (potentially the CIME) during the first years, and potentially (according to the specificities of the National REDD+ Fund to be designed in October) a specific Executive Board will be implemented to replace the COPIL in this task.

Payments from the Carbon Fund will be made directly to a specific account in the National REDD+ Fund. This account will be used to channel results-based payments from institutional buyers but also to give grants for enabling and sectoral investments under the National REDD+ Strategy.

Figure 20: Financial flow within the ER-P for carbon revenues sharing



Once the overall financial structure will be validated (December 2018) an ER-P manual of procedures will be developed to outline the structure of the funds management mechanism within the National Fund. At this stage, it can be summarized as follows according to some of the stages of disbursement of funds for performance-based payments and investments:

- The MRV report on the monitoring of the jurisdiction’s ERs is forwarded by the BNC REDD+ to the Carbon Fund Manager who then mandates an independent verification;
- The payments of emission reduction credits sold under the ER-PA are paid to the dedicated account in the National REDD+ Fund;
- ERs monitoring reports for each project, and based on proxies, are included in the activity reports at all levels and are compiled by the BNC REDD+, validated by the PFN REDD+ and then uploaded into the Registry. As these reports specify the performance of the actors included in the program (with proxy), they will allow for identifying the use of carbon revenues during the next ^phase of implementation (considered as an investment plan because REDD+ project funding is considered as “advanced-payment”), based on the performance and experience of projects implemented in the previous phase, as well as priority intervention zones determined in the Regional REDD+ Strategies (see section 15);

- The COPIL REDD+ and then the Executive Board will validate the overall REDD+ activity plan of the ER-P;
- The National REDD+ Fund management entity (unidentified yet) distribute revenue according to the validated REDD+ activity plan between regions and large-scale projects (potentially through BNC REDD+ and BRC REDD+ that will be in charge of administrative management of the program).

6.2. ER PROGRAM BUDGET

The planned Madagascar ERP Area represents a total area of 6,235,720 ha located over a large portion of the eastern region of Madagascar, from the coast to the crest line dividing the island between its eastern (Indian ocean) and western flowing watersheds. Over the next 5 years, funding is available to implement Emission Reduction compatible activities over 1,791,816 ha (ca 27.4% of the planned application area). **The total amount of the emission reduction estimated to be generated during the ERPA is 13,929,519 tCO₂eq**, which are drawn from six different projects:

- World Bank PADAP project (hereafter abbreviated as PADAP);
- Madagascar National Parks (hereafter abbreviated as MNP);
- World Bank CASEF project (hereafter abbreviated as CASEF);
- Missouri Botanical Gardens (hereafter abbreviated as MBG);
- Conservation International (hereafter abbreviated as CI);
- Wildlife Conservation society (hereafter abbreviated as WCS);

As negotiations with individual project proponents are currently underway, the original assumptions made in the budget for the ERP may not align with final results. However, as these efforts are not yet complete and formal agreements not yet reached, the budget has not yet been updated with needed information regarding the role of the two pilot projects or the role of GCF funding in the program's budget. Information provided in this section reflects the most updated information at the time of submission, but it does not yet provide sufficient information to update the budget in Annex II. Therefore, the annex II summarizing the ER-P budget will be revised and should be viewed as preliminary and not yet complete.

Continuation of Readiness activities in support of ER-P implementation

Readiness funding granted by the FCPF to Madagascar for the REDD+ preparation process is available until year 2020 and allows the structures set up for the national program, including BNCR as well as implementation of the NFMS, to function during the transition to ERP implementation, while not being used for activities on the ground.

REDD+ ER funding in year 3

This is the anticipated amount for REDD+ related ER derived from the MERPA. At this stage, most of this funding is anticipated in Year 3 of the program due to the more pronounced role of the existing projects in the early years of ERP income generation. The national government and the BNC REDD+ will use

program funds from these payments to maintain operations (NFMS, FREL, functioning of REDD+ related structures) and reinvest in highly beneficial (based on a cost benefit analysis of activities and geographic features) new REDD+ projects in order to rapidly gain additional ERs over a larger portion of the ERP area.

Grant funding

There are multiple grant funding sources supporting the six projects of this program at this stage. In the current budget, grant funding will contribute approximately 19.24 M USD to the program.

Loan funding

The loans available for the project represent one main projects (PADAP) and represent a total amount of 12.03 M USD. This loan has a planned interest repayment schedule over 30 years and interest rates indicated at circa 1.56% per annum. The loan has a 5-year grace period and will mostly start eliciting repayment terms from the end of the ERPA period. The loan is structured repayments by the Government of Madagascar in the case of the IDA (PADAP).

Institutional Coordination and MRV

Over the project 5 years' lifetime, the institutional and coordination will cost 9.28 M USD (ca 1.85 M USD per annum). Approximately 6.00 M USD will be funded from the REDD+ readiness fund, applied to institutions which will operate for the national program, while first being implemented and tested in the ERP. The rest will have to be funded through the sale of ER credits. The planned amount will be split between the national REDD+ office and its regional dependent offices as one cost point (50.8% of the annual amount), the NFMS (inclusive of MRV) / FREL aspects will cost 0.59 M USD per annum (30.8% of the per annum total), the Safeguard Information System (SIS) and benefit sharing management will cost 0.04 M USD per annum (2.3% of the per annum total), the Grievance and Redress Mechanism will cost 0.03 M USD per annum (1.5% of the per annum total), and finally the annual local level engagement will cost 0.22 M USD per annum (14.5% of the per annum total).

Categories of activity

As funding streams represent up to 300 separate activities, in order to develop a comparable process, it was necessary to simplify the detailed budgets of each of the funding streams within a restricted range of overarching categories of actions that regroup a range of activities. A total of 15 categories have been developed and activities within the detailed budgets were classified within such categories. A detailed description of the categories and the activities encompassed is presented in Annex III. Additionally, in order to understand how the funding streams, contribute to the generation of ERs, the detailed budgets for each funding stream were distinguished between directly eligible components and indirectly eligible components. Directly eligible components represent activities which, when implemented, may generate ERs directly. This could for example be conservation of degraded forests providing a chance for such forests to naturally regenerate and therefore "capture" CO₂ and generate ERs through natural growth.

Indirectly eligible activities typically represent the “support mechanism” for the directly eligible components such as the project management activities that lead to conservation actions. Indirectly eligible activities are also represented by activities that handle other topics, but through their application an impact on ER generation is elicited, such as land tenure rights for example, which once secured could allow farmers to plan woodlots.

7. CARBON POOLS, SOURCES AND SINKS

In order to understand the sources and sinks that are significant as defined by the Methodological Framework, a Key Category Analysis was conducted following the 2006 IPCC GL and based on Tier 2 and Tier 1 data. GHG emissions and removals for deforestation, degradation and enhancement of carbon stocks (afforestation/reforestation) were estimated with Tier 2 data, except for the litter and SOC pools. GHG emissions and removals from forest management in forest plantations was not included.

Table 9. Results of the Key Category Analysis

REDD activity	Change category	Source	GHG (tCO ₂ e/year)	Contribution absolute (%)
Deforestation	Forestland to Other Land	AGB	9,812,059	59%
		BGB	2,337,496	14%
		DW	609,690	4%
		LT	303,834	2%
		SOC	541,506	3%
		non-CO ₂	399,332	2%
Degradation	Forestland remaining forestland	AGB	1,509,718	9%
		BGB	362,332	2%
		DW	0	0%
		LT	0	0%
		SOC	0	0%
		non-CO ₂	131,866	1%
Sustainable management of forests	Forestland remaining forestland	-	0	0%
Enhancement of carbon stocks	Other Land to Forestland	AGB	323,888	2%
		BGB	64,778	0%
		DW	77,077	0%
		LT	69,322	0%
		SOC	36,253	0%
		non-CO ₂	0	0%
Total absolute GHG emissions and removals	16,604,408	100%		

7.1.DESCRPTION OF SOURCES AND SINKS SELECTED

This section discusses the consideration of different sinks and sources which are considered by the proposed ER Program. Following Indicator 3.1 of the FCPF Methodological Framework (MF), the Program is required to identify sinks and sources of any REDD+ activity accounted for under the ER Program.

The different REDD+ activities are defined by Decision 1/CP.16, §70.a-3. The table below discusses the inclusion / exclusion of sinks and sources in the ER Program for each of these activities.

Table 10. Sources and Sinks accounted for under the ER-Program

<i>Sources/Sinks</i>	<i>Included?</i>	<i>Justification / Explanation</i>
<i>Emissions from deforestation</i>	Yes	<ul style="list-style-type: none"> According to the Key Category Analysis shown in Table 9, GHG emissions from deforestation represent 84% of total absolute forest related GHG emissions. GHG emissions from deforestation of forestry plantations are not considered in this version of the ERPD.
<i>Emissions from forest degradation</i>	Yes	<ul style="list-style-type: none"> According to the key category analysis is presented in Table 9, GHG emissions from forest degradation represent 12% of absolute total GHG emissions and removals. Consequently, the emissions from degradation are accounted for as they are considered to be significant (>10% of all forest-related emission in the reference period, cp. Indicator 3.3 of the MF).
<i>Removals from enhancement of carbon stocks</i>	Yes	<ul style="list-style-type: none"> According to the key category analysis is presented in Table 9, GHG removals for afforestation/reforestation accounts for 3% of total absolute forest related emissions. Enhancement of carbon stocks in Forestland Remaining Forestland has not been accounted for due to lack of data. GHG removals from the establishment of commercial plantations for timber are not considered in this version of the ERPD.
<i>Emissions and removals from conservation of carbon stocks</i>	No	<ul style="list-style-type: none"> There is not a national definition for this REDD+ activity. However, there is a comprehensive accounting for GHG emissions and removals from forests so GHG emissions and removals that could potentially be included in this activity are included in previous REDD+ activities.
<i>Emissions and removals from sustainable management of forest</i>	No	<ul style="list-style-type: none"> There is not a national definition for this REDD+ activity, but the management of commercial plantations for timber would probably enter in this category. GHG emissions and removals from these activities are not accounted for in this version of the ERPD.

7.2. DESCRIPTION OF CARBON POOLS AND GREENHOUSE GASES SELECTED

This section outlines which carbon pools and which greenhouse gases (GHG) are included or excluded under the ER Program. In total the ER program accounts for **98% of total absolute forest related emissions**.

Table 11. Carbon Pools accounted for under the ER-Program

<i>Carbon Pools</i>	<i>Selected?</i>	<i>Justification / Explanation</i>
<i>Above Ground Biomass (AGB)</i>	Yes	According to the Key Category Analysis presented in Table 9, emissions from AGB for the activities included constitute 70% of total absolute forest related GHG emissions (i.e. more than 10% of total forest related emissions in the accounting area during the reference Period). This carbon pool largely contributes not only to the emissions, but, if successful also to the emission reductions of the proposed ER Program. Hence the emissions of this pool are considered.
<i>Below Ground Biomass (BGB)</i>	Yes	The ER Program makes use of root-shoot ratios with an order of magnitude of 20-25% of AGB. According to the Key Category Analysis presented in Table 9, removals and emissions from this pool for the activities included represent 17% of total absolute forest related GHG emissions, hence the emissions from the BGB pool are significant (i.e. more than 10% of total forest related emissions). Consequently, this pool is considered for accounting of the overall emissions as well as emission reductions.
<i>Dead Wood (standing)</i>	Yes	Only emissions from the standing dead wood pool are accounted for as there is no data for lying dead wood. According to the Key Category Analysis presented in Table 9, removals and emissions from this pool for the activities included represent 4% of total absolute forest related GHG emissions, and 89% of these correspond to deforestation. Therefore, only emissions from the dead wood pool from deforestation will be accounted for.
<i>Litter</i>	Yes	Only emissions from the standing dead wood pool are accounted for as there is no data for lying dead wood. According to the Key Category Analysis presented in Table 9, removals and emissions from this pool for the activities included represent 2% of total absolute forest related GHG emissions, and 81% of these correspond to deforestation. Therefore, only emissions from the litter pool from deforestation will be accounted for.
<i>Soil Organic Carbon (SOC)</i>	Yes	According to the Key Category Analysis presented in Table 9, removals and emissions from this pool for the activities included represent 3% of total absolute forest related GHG emissions, and 94% of these correspond to deforestation. Therefore, only emissions from the litter pool from deforestation will be accounted for.

Table 12. GHG included

<i>GHG</i>	Selected?	Justification / Explanation
<i>CO2</i>	Yes	<ul style="list-style-type: none"> • CO2 represents the most important part of emissions from deforestation in Madagascar, mainly due to slash and burn agriculture.
<i>CH4</i>	Yes	<ul style="list-style-type: none"> • Non-CO2 GHG emissions in deforestation and degradation represents 3% of absolute total GHG emissions. • However, only GHG emissions from deforestation will be accounted for as non-CO2 emissions from forest degradation does not have the necessary quality.
<i>N2O</i>	Yes	<ul style="list-style-type: none"> • Non-CO2 GHG emissions in deforestation and degradation represents 3% of absolute total GHG emissions. • However, only GHG emissions from deforestation will be accounted for as non-CO2 emissions from forest degradation does not have the necessary quality.

8. REFERENCE LEVEL

8.1. REFERENCE PERIOD

The reference period for the ER-Program is 2005-2015. The reference period thus covers approx. 10 years and is set 2 years before the TAP review which commenced August 2017. As such the reference period is considered to be in accordance with criterion 11 of the MF and thus no justification is needed.

8.2. FOREST DEFINITION USED IN THE CONSTRUCTION OF THE REFERENCE LEVEL

a. *Forest definition*

Madagascar's Designated National Authority (DNA)⁷⁰ submitted a forest definition to the UNFCCC for Afforestation/Reforestation projects under the CDM (See Table 13). This definition is consistent to the definition used in the most recent national communication submitted in 2010⁷¹. In April 2016, a workshop was organized for the definition of REDD+ activities and the definition of the sampling plan for the forest inventory in the secondary and degraded formations of the ER program area⁷², and this forest definition was retained in the context of the REDD+. This same forest definition has been retained for the Forest Reference Emission Level (FREL) submitted to the UNFCCC in January 2016 in the context of REDD+⁷³.

Table 13. Thresholds of Madagascar's forest definition

<i>Thresholds</i>	<i>Value</i>
<i>Minimum height of trees (m)</i>	≥ 5m
<i>Minimum canopy cover (%)</i>	≥ 30%
<i>Minimum area (ha)</i>	≥ 1

In the context of the communication to 2015 Forest Resource Assessment (FRA), the evergreen forest and the other forest classes of the 1996 National Forest Inventory (IFN96) were used as an equivalency to the FAO forest definition⁷⁴. Such classification is an ecological classification that is based primarily on phytogeographic characteristics and height of the vegetation. As part of the NFMS development process, new values will be reported and an equivalency with the FAO definition will be established.

Sub-classes of forests

⁷⁰ <http://cdm.unfccc.int/DNA/index.html>

⁷¹ BNCCC. 2017. Personal communication

⁷² Pp. 3, SECRETARIAT GENERAL - BUREAU NATIONAL DE COORDINATION – REDD+. 2016. *Rapport de l'atelier de definition de la deforestation et de la degradation et presentation du niveau de reference*. Hôtel Bezanozano – Moramanga. 20 au 22 Avril 2016

⁷³ http://redd.unfccc.int/files/20170116_draft_soumission_ccnucc_frel_madagascar_fr.pdf

⁷⁴ <http://www.fao.org/3/a-az264f.pdf>

At the time of this document there is no Land Use Land Cover (LULC) stratification scheme formally approved in Madagascar and it is expected that this will happen during 2017 as part of the MRV development.

Stratification schemes adopted in past inventories and cartographies under the 1996 National Forest Inventory (IFN96) and the 2014 Humid Forest Eco-Regional REDD + Project (PERR-FH) were based on ecological zoning that distinguished four main ecoregions divided in some cases in ecological subregions: Eastern Humid Forest, Western Dry Forest, Southern Spiny Forest and Mangrove. The FREL submitted to the UNFCCC has adopted this classification in four ecoregions.

In 2016 a forest inventory was conducted by DVRF in secondary vegetation and forests not covered by the PERR-FH. As part of this inventory a stratification scheme was adopted for these specific formations in an attempt to obtain representative average estimates of these formations⁷⁵. In this case, secondary forest formations were inventoried: Ravenala, Ravenala Mixte, Agroforestry, Savoka vieux, and Single Layer.

Following the guidance provided in the GFOI MGD, since there is no LULC stratification scheme formally adopted, forest has been stratified following the Forest Resource Assessment (FRA) convention: primary forest, modified natural forest and plantations. Primary formations are those predominantly intact that were measured by the PERR-FH, the modified natural forest are those that were measured by the DVRF inventory in 2016 while plantations were only covered partially by the DVRF inventory as agroforestry systems were measured.

Table 14. Types of forests

Level 1 (GIEC)	Level 2 (FRA definition)		Level 3 (National classes)	
Forest land	Primary forest	Essentially intact natural forest	1. Primary forest	Dense forest with no signs of disturbance. Located generally in remote areas and far from the forest edges.
	Modified Natural Forest	Forests with native tree species that have grown naturally where there is evidence of human activities. FRA, 2015 refers to Primary Forest, Other Naturally Regenerated Forest and Planted Forest	2. Disturbed forest	Dense forest with signs of disturbance or located close (<100 metres) to deforestation events. This results from the degradation of primary forest. Equivalent to the Single Layer class measured by the inventory DVRF 2016.
	Plantations	Forests composed of trees established	3. Secondary forest	Dense or open forest that results from regrowth after deforestation. Secondary vegetation measured by DVRF in 2016 (Ravenala, Ravenala Mixte, Savoka vieux)
			4. Forest plantations	Forest plantations established for timber production purposes.

⁷⁵ Direction De La Valorisation Des Ressources Forestieres. 2016. Offre technique des travaux d’inventaire forestier et evaluation de l’integrite ecologique dans les deux ecosystemes forestiers humides de l’est et seches de l’ouest de madagascar dans le cadre du redd+

	through planting or seeding by human intervention. They include semi-natural plantation forests with indigenous species and plantation forests comprised of exotic species.	5. Agroforestry Agroforestry systems are mainly plantations of clove or other fruit trees. Equivalent to agroforestry class measured by the inventory DVRF 2016.
Non Forest	This includes a range of different land not complying with the forest definition.	

It is important to note that, although being forests, forestry plantations will not be considered in this version of the ERPD for accounting purposes.

More information on the operationalization of the forest definition and forest types may be found in Annex V.I.

b. *Definition of REDD+ activities*

In April 2016, Madagascar decided preliminary definitions for the different REDD+ activities that were deemed applicable to the country. These definitions were to be tested as part of the ER program. Based on comments from the TAP, these definitions have been modified with regards the minimum area of deforestation (previously a minimum area of 0.36 ha).

Table 15. Definitions of REDD+ activities as approved by Madagascar

Activity	Definition
<i>Deforestation</i>	A direct human induced conversion of forestland to non-forestland, of a continuous area of at least 1 ha, whether temporal or permanent. For example, conversion of primary forest into “Tavy” system would be deforestation even though this conversion is temporary. The conversion of a secondary forest to a non-forest would also be deforestation.
<i>Forest degradation</i>	Long-term reduction of forest carbon stocks due to anthropogenic disturbances resulting from canopy loss, not qualified as deforestation. For example: forest degradation represents the transition from a primary forest to a disturbed forest that contains gaps and indication of human disturbance.
<i>Enhancement of carbon stocks</i>	Increased forest carbon stocks, either through a transition from non-forestland to forestland, or through the growth and / or restoration of existing forests.

In order to operationalize these definitions the following transitions were assigned to each REDD activity:

Table 16. Attribution of transitions to each REDD activity. na = not possible; *=not accounted for; =no changes

		Land cover after conversion					
		Primary Forest	Disturbed forest	Secondary forest	Forestry plantations	Agroforestry	Non Forest
Land cover before conversion	Primary Forest	-	<i>Degradation</i>	<i>na</i>	<i>Degradation</i>	<i>Degradation</i>	<i>Deforestation</i>
	Disturbed Forest	<i>na</i>	-	<i>na</i>	<i>Degradation*</i>	<i>Degradation*</i>	<i>Deforestation</i>
	Secondary forest	<i>na</i>	<i>na</i>	-	-	-	<i>Deforestation</i>
	Forestry plantations	<i>na</i>	<i>na</i>	<i>na</i>	-	-	<i>Deforestation*</i>
	Agroforestry	<i>na</i>	<i>na</i>	<i>na</i>	-	-	<i>Deforestation</i>
	Non forest	<i>na</i>	<i>na</i>	<i>Enhancement</i>	<i>Enhancement*</i>	<i>Enhancement</i>	-

More information on the operationalization of the definitions may be found in Annex V.I.

8.3. AVERAGE ANNUAL HISTORICAL EMISSIONS OVER THE REFERENCE PERIOD

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

In accordance with the methodological framework, the ER Program was developed following the rules and methods proposed by the 2006 IPCC Good Practice Guidelines for National Greenhouse Gas Inventories. A summary of the equations and the Tier applied is provided in the following table. A more detailed description of the methods applied, assumptions, decisions and default values applied may be found in Annex V.I.

Source/Sink	Pool	Methods	Tier
Deforestation	Biomass	Equation 2.16 and 2.8b of 2006 IPCC Volume 4 GFOI MGD, Chapter 3.1.2	Tier 2 (aboveground) Tier 1/2 (belowground)
	Dead Organic Matter (Dead wood and litter)	Equation 2.23 of 2006 IPCC Volume 4	Tier 2 (Dead wood) Tier 1 (Litter)
	Soil Organic Carbon	Equation 2.25 2006 IPCC GL Volume 4	Tier 1
	Non-CO2 emissions	Equation 2.27 2006 IPCC GL Volume 4	Tier 1
Degradation	Biomass	GFOI MGD, Chapter	Tier 2 (aboveground)

		3.1.3	Tier 1/2 (belowground)
Enhancement of carbon stocks	Biomass	GFOI MGD, Chapter 3.1.4	Tier 2 (aboveground) Tier 1/2 (belowground)

The equations and explanation of methodological choices is provided in Annex V.II. According to the methodological choices, the only parameters that are measured or estimated and not based on IPCC defaults would be the following. In essence these are activity data parameters and parameters that are part of the emission factors.

Table 17. Parameters for estimation of carbon stock changes from deforestation

Source/Sink	Parameter	
Deforestation	$A(j, i)$	Annual conversion from forest type j , to non-Forest Land uses i (Non-Forest).
	$AGB_{Before,j}$	Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha.
	$AGB_{After,i}$	Aboveground biomass of non-forest type i after conversion, in tonnes dry matter per ha;
	C_o	dead wood/litter stock, under the old land-use category, tonnes C ha ⁻¹ .
Degradation	$A(j, i)$	Annual conversion from forest type j (primary forest), to Forest type i (modified natural forest or plantations)
	$AGB_{Before,j}$	Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;
	$AGB_{After,i}$	Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;
Enhancement of carbon stocks	$A(i, j)$	Annual conversion from non-Forest Land use i to forest type j (planted forest or modified natural forest)
	$AGB_{Before,i}$	Aboveground biomass of non-forest type j before conversion, in tonne of dry matter per ha;
	$AGB_{After,j}$	Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;

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

Activity Data

As explained above, GFOI Methods and Guidance Document (MGD) guidance⁷⁶ is used in order to estimate GHG emissions from deforestation and enhancement of carbon stocks (afforestation and reforestation). Considering these methods, the required AD is provided in the following table:

⁷⁶ Chapter 5 of the GFOI MGD Version 2.0

Table 18. Parameters of activity data estimated for the reference level

	Activity Data	Source
$A(j, i)$	Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest)	Deforestation
$A(j, i)$	Annual conversion from forest type j (primary forest), to Forest type i (modified natural forest or plantations)	Degradation
$A(i, j)$	Annual conversion from non-Forest Land use i to forest type j (planted forest or modified natural forest)	Enhancement of carbon stocks (afforestation/reforestation)

The AD has been estimated following the methods described in Section 5.1.5 of the MGD. Following the decision framework of Figure 12 of the MGD, a stratified random estimator based on new reference data has been selected for estimating activity data and variance since:

- The use of forest cover change maps to produce activity data was planned (1, 2), the reason being that spatially-explicit LULC and LULC change information is desired for the ER program area for various purposes: definition of risk areas useful for planning purposes and benefit sharing; testing methods in order to feed into the NMFS development and operationalization; etc.
- No reference samples of change observations (3) were available. Only reference data from single date inventories were available, so it was decided to collect newly reference data based very high, high and medium resolution imagery available.
- A stratified estimator was selected (5) as the forest cover change map can be used for stratification purposes and the variable of interest is a proportion, not a continuous variable.

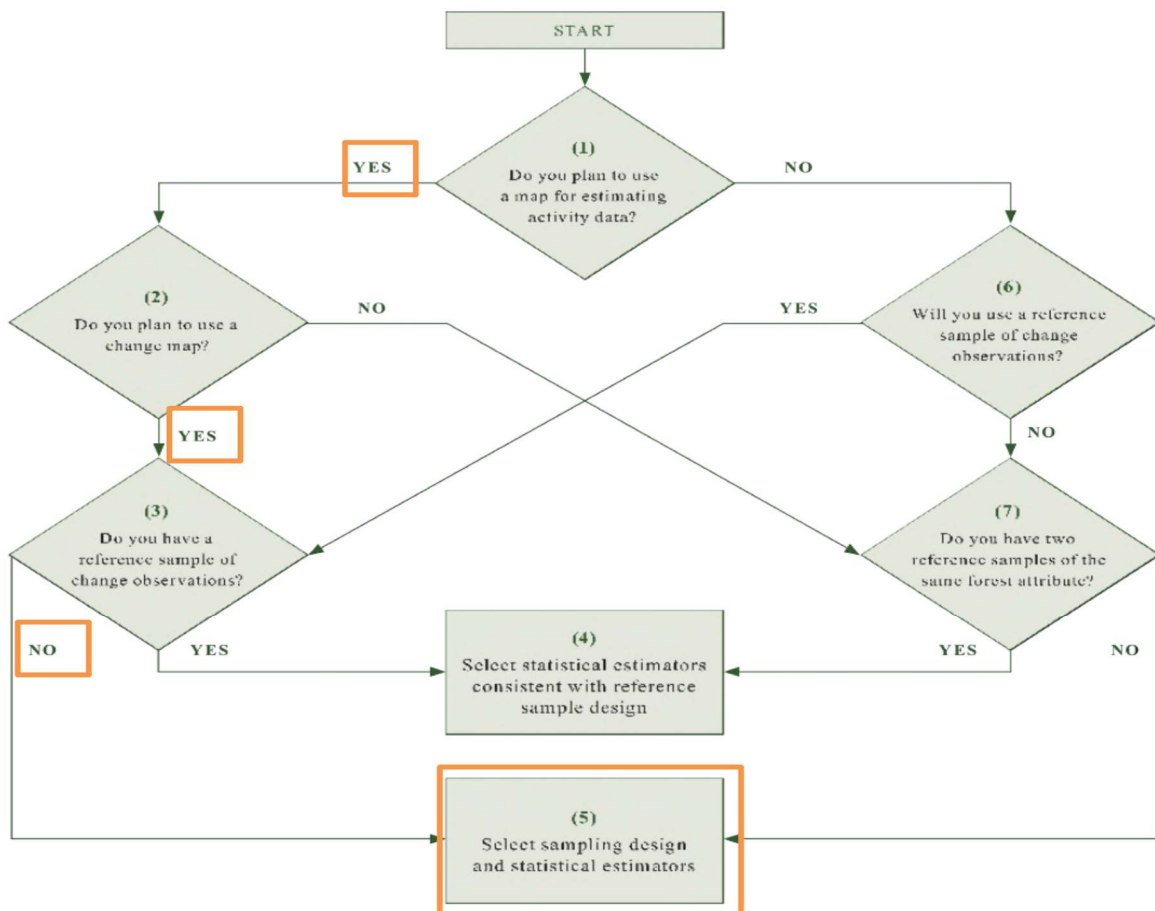


Figure 21. Decision framework as shown in Figure 12, in Section 5.1.5 of the MGD

The sampling design is presented following the structure proposed in Olofsson et al. (2014) and is found in the table below.

Table 19. Parameters of Activity Data

<i>Description of the parameter:</i>	$A(j, i)$ - Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest) in period 2005-2015 $A(j, i)$ - Annual conversion from forest type j (primary forest), to Forest type i (modified natural forest or plantations) $A(i, j)$ - Annual conversion from non-Forest Land use i to forest type j (planted forest or modified natural forest) in period 2005-2015																			
<i>Sources or sinks:</i>	Deforestation																			
<i>Data unit:</i>	ha/year																			
<i>Value for the parameter:</i>	<table border="1"> <tr> <td rowspan="4">Deforestation</td> <td>Primary forest</td> <td>1,738</td> </tr> <tr> <td>Disturbed forest</td> <td>29,273</td> </tr> <tr> <td>Secondary forest</td> <td>8,148</td> </tr> <tr> <td>Agroforestry</td> <td>300</td> </tr> <tr> <td rowspan="2">Enhancement</td> <td>Secondary forest</td> <td>3,522</td> </tr> <tr> <td>Agroforestry</td> <td>2,480</td> </tr> <tr> <td colspan="2">Degradation</td> <td>10,944</td> </tr> </table>	Deforestation	Primary forest	1,738	Disturbed forest	29,273	Secondary forest	8,148	Agroforestry	300	Enhancement	Secondary forest	3,522	Agroforestry	2,480	Degradation		10,944		
Deforestation	Primary forest		1,738																	
	Disturbed forest		29,273																	
	Secondary forest		8,148																	
	Agroforestry	300																		
Enhancement	Secondary forest	3,522																		
	Agroforestry	2,480																		
Degradation		10,944																		
<i>Source of data or description of the method for developing the data:</i>	<p>As indicated previously, design based inference of reference samples and the forest cover change map as stratification map has been used in order to estimate the activity data.</p> <p>Sampling design</p> <p><u>Estimator:</u> Stratified random estimator of a proportion</p> <p><u>Stratification:</u> A forest cover change map is used as stratification criteria. This map is a combination of a forest cover map for 2005, a deforestation map and a forest gain map, which was further simplified in the legend shown below. More information on the methods for production of the maps is provided in Annex VI.</p> <p>Classes</p> <ol style="list-style-type: none"> 1. Primary forest 2. Modified Natural Forest 3. Non Forest 4. Deforestation of Primary Forest 5. Deforestation of Modified Natural Forest 6. Afforestation/reforestation 7. Others <p><u>Precision and confidence level:</u></p>																			

Relative margin of error of 10% at 90% of confidence level as requested

Calculation of number of samples:

For the calculation of the number of samples, the equation from Cochran (1977, Eq. (5.25)) was used assuming that the cost of sampling each stratum is the same:

$$n = \frac{(\sum W_h S_h)^2}{[S(\hat{O})]^2 + (1/N) \sum W_h S_h^2} \approx \left(\frac{\sum W_h S_h}{S(\hat{O})} \right)^2$$

Where:

W_h Weight of stratum i ;

S_h Standard deviation of variable of interest in stratum i ;

$S(\hat{O})$ Standard error of the variable of interest;

N Number of sampling units in the region of interest (i.e., population size);

In order to estimate the number of samples, the proportions obtained in a first pilot sample were used.

Class	Proportion	Weight	Number of samples	No Samples retained
DMNF	0.642	0.03	64	100
DPF	0.396	0.06	125	125
GA	0.044	0.02	32	100
MNF	0.048	0.11	229	229
NF	0.022	0.54	1108	500
PF	0.020	0.24	486	486
OTHER	0.020	0.00	2	100
Total				1640

Drawing of samples

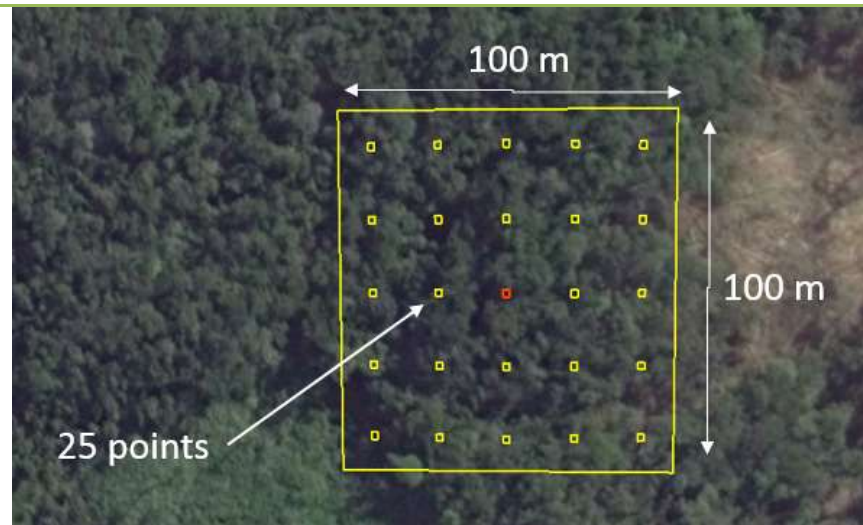
The drawing of samples was done by locating the number of necessary random points within each strata, i.e. an infinite population approach⁷⁷.

Response design

Spatial assessment unit:

The spatial assessment unit is a squared area of 100 meter of side which contains 25 points inside and which is centered on the random point selected from the sampling frame. Considering the acceptable geolocation error of Landsat imagery is 30 metres, this spatial assessment unit would be justified.

⁷⁷ http://wiki.awf.forst.uni-goettingen.de/wiki/index.php/Approaches_to_populations_of_sample_plots



Source of the reference data:

The reference data in this case will be collected through visual interpretation of all satellite imagery available to the country. This includes:

- SPOT 6/7: High resolution imagery (5 m resolution) for 2014/2015
- Google Earth and Bing: All high and very high resolution imagery accessible through Google Earth and Bing. The spatial coverage of very high resolution imagery in the ER program area is relatively high, with many areas with coverage from 2005 to 2015.
- Aster: Resolution of 15 metres from 2000 to 2010
- Landsat 5,7 and 8: Available through google earth engine.
- Sentinel 2: Available through google earth engine.

It is considered that this is reference data as most of the interpretations will be based on direct interpretation of higher resolution imagery for different periods which provides the necessary temporal contextual information.

Reference labelling protocol

- Forest/Non Forest classification: In order to attribute the condition of forest to the sample, the interpreter would evaluate how many points of the grid would fall over forest (a differentiated object that has at least one ha in area and has 30% of tree canopy cover). If at least 13 points (>50% of points) fall in forest, the point would be classified as forest, otherwise as non-forest. This method ensures that there is not a overrepresentation of forest, which happens with hierarchical classification systems. In the example below, 24 points fall in forest area (delineated with a polygon), so the sample is classified as forest.



- Forest types: If the sample is classified as forest, the sample would then be attributed to one of the 5 forest types based on the majority class present:
 - Primary forest
 - Modified Natural forest – Disturbed forest
 - Modified Natural forest – Secondary forest
 - Plantation – Agroforestry
 - Plantation – Plantation for timber
- Interpretation has been based on a protocol which is provided in annex.
- QA/QC: A number of QA/QC procedures have been applied:

Only the pixels that comply with the minimum mapping unit required and that have a high quality of interpretation are retained. As a result: 594 samples resulted.

Strata	Deforestation				Enhancement		Degradation		TOTAL SAMPLES
	Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to	Primary forest to	
PF	1	15	1	0	1	2	15	0	482
MNF	1	12	2	0	0	1	11	0	227
NF	0	17	9	0	4	2	1	0	498
DPF	3	15	1	0	0	0	6	0	124
DMNF	1	21	4	1	1	0	2	0	98
GA	0	6	0	1	3	2	0	0	98
OTHER	0	1	1	0	0	0	3	0	98

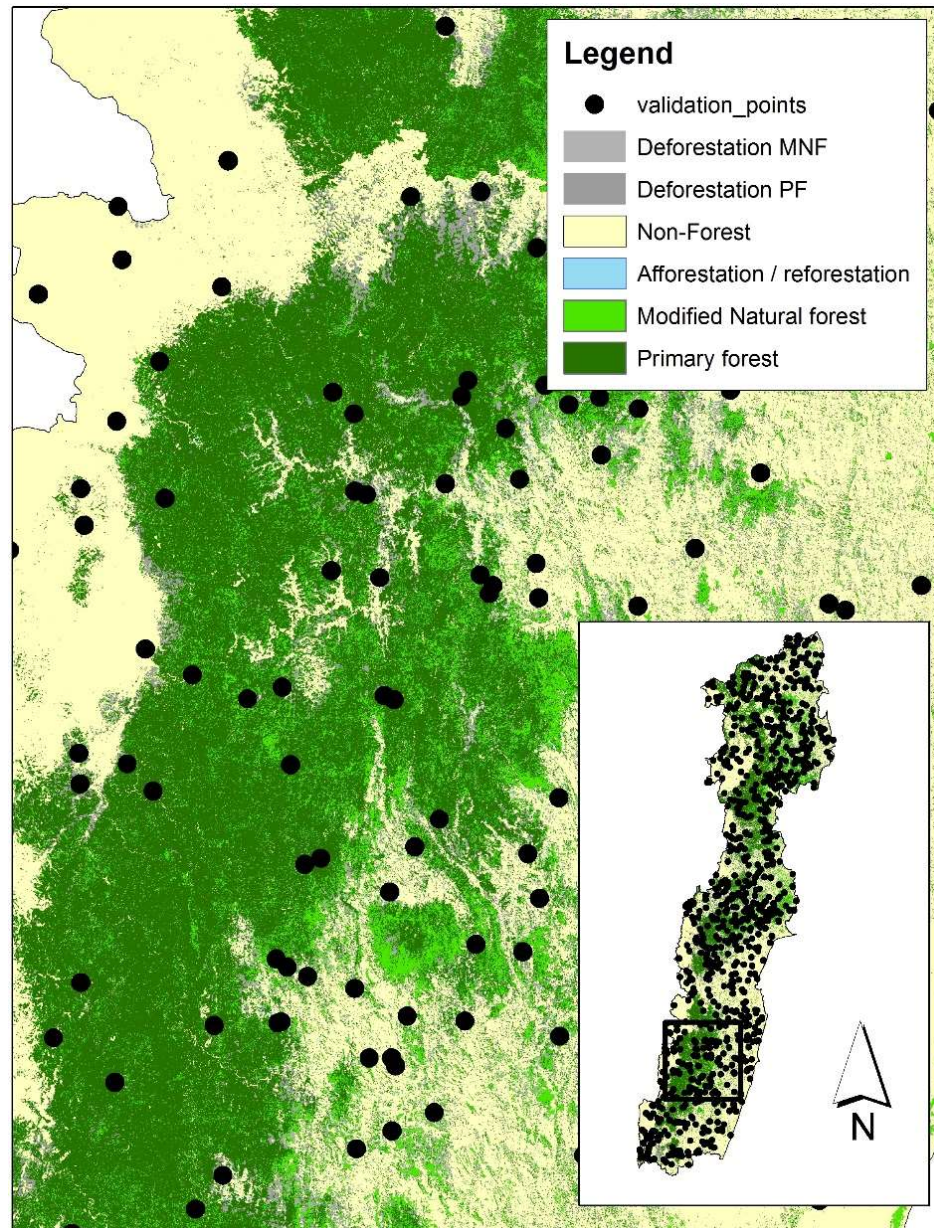


Figure 22. Example of location of sampling units and stratification

Analysis design

The average proportion of the variable of interest in the reference period will be estimated through the stratified random estimator of the mean ($\hat{\mu}_{STR}$)

$$\hat{\mu}_{STR} = \sum_h^H W_h \hat{\mu}_h$$

Where:

W_h Weight of stratum h ;

$\hat{\mu}_h$ Sample estimates within stratum h which is equal to $\hat{\mu}_h = \frac{1}{n_h} \sum_{k=1}^{n_h} y_{hk}$

where y_{hk} is the k^{th} sample observation in the h^{th} stratum

In order to convert the proportions to areas, the average proportion is multiplied by the total area of the region of interest of 6,235,954 ha.

	Deforestation				Enhancement		Degradation	
	Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to modified natural forest	Primary forest to
Stratified estimate	0.003	0.047	0.013	0.000	0.006	0.004	0.018	0
Area estimate (ha)	17,384	292,726	81,475	3,004	35,223	24,796	109,436	0

In order to express the proportion of deforestation or afforestation/reforestation in annual basis, the sample estimate is divided by the duration of the reference period (i.e. 10 years).

	Deforestation				Enhancement		Degradation	
	Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to modified natural forest	Primary forest to
Area estimate (ha)	1,738	29,273	8,148	300	3,522	2,480	10,944	0

More information is provided in the spreadsheet "MADA_AD_Estimation_V3".

QA/QC

QC procedures in this case consist in the establishment of a Standard Operating Procedure (SOP) for the interpretation of the samples and the application of training procedures in order to ensure the correct data collection. Expert interpreters were used, sufficiently trained, with a specific SOP for interpretation. Moreover, the interpreters indicate whether the quality of interpretation is high or low, so this serves to filter out those points that are of low quality in the interpretation. All low quality samples are re-assessed.

	QA procedures in this case consist in revisiting 10% of the samples in order to confirm the correction implementation of SOPs. Moreover, an external person to this has checked the consistency of the data.																										
<i>Spatial level:</i>	Regional																										
<i>Key uncertainties:</i>	Main uncertainty is sampling uncertainty. See Chapter 12.																										
<i>Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:</i>	<p>The 90% relative margin of error would be estimated with:</p> $Error_{90\%} = t_{student} \cdot \sqrt{\widehat{Var}(\hat{\mu}_{STR})}$ <p>Where:</p> <p>$t_{student}$ The t of student with $n-h-1$ degrees of freedom where n is the number of samples and h is the number of strata.</p> <p>$\widehat{Var}(\hat{\mu}_{STR})$ variance of the stratified estimate.</p> <p>The variance of the stratified estimate is estimated as follows:</p> $\widehat{Var}(\hat{\mu}_{STR}) = \sum_h^H W_h^2 x \hat{\sigma}_h^2$ <p>Where:</p> <p>W_h Weight of stratum h;</p> <p>$\hat{\sigma}_h^2$ Sample variance estimates within stratum h which is equal to $\hat{\sigma}_h^2 = \frac{1}{n_h-1} \sum_{k=1}^{n_h} \hat{\mu}_h * (1 - \hat{\mu}_h)$ where $\hat{\mu}_h$ is the sample estimates within stratum h.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"></th> <th colspan="4">Deforestation</th> <th colspan="2">Enhancement</th> <th colspan="2">Degradation</th> </tr> <tr> <th>Primary forest</th> <th>Disturbed forest</th> <th>Secondary forest</th> <th>Agroforestry</th> <th>Secondary forest</th> <th>Agroforestry</th> <th>Primary forest to modified natural</th> <th>Primary forest to plantations</th> </tr> </thead> <tbody> <tr> <td>90% confidence – Relative margin of error</td> <td>68%</td> <td>19%</td> <td>43%</td> <td>123%</td> <td>66%</td> <td>73%</td> <td>28%</td> <td>0%</td> </tr> </tbody> </table> <p>More information is provided in the spreadsheet “MADA_AD_Estimation_V3”.</p>		Deforestation				Enhancement		Degradation		Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to modified natural	Primary forest to plantations	90% confidence – Relative margin of error	68%	19%	43%	123%	66%	73%	28%	0%
	Deforestation				Enhancement		Degradation																				
	Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to modified natural	Primary forest to plantations																			
90% confidence – Relative margin of error	68%	19%	43%	123%	66%	73%	28%	0%																			

Emission factors

As explained above, GFOI Methods and Guidance Document (MGD) guidance⁷⁸ is used in order to estimate GHG emissions from deforestation and enhancement of carbon stocks (afforestation and reforestation). Considering these methods, the required AD is provided in the following table:

Table 20. Parameters of activity data estimated for the reference level

	Activity Data	Source
$AGB_{Before,j}$	Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;	Deforestation
$AGB_{After,i}$	Aboveground biomass of non-forest type I after conversion, in tonnes dry matter per ha;	
$AGB_{Before,i}$	Aboveground biomass of non-forest type j before conversion, in tonne of dry matter per ha;	Degradation
$AGB_{After,j}$	Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;	
$AGB_{Before,i}$	Aboveground biomass of non-forest type j before conversion, in tonne of dry matter per ha;	Enhancement of carbon stocks
$AGB_{After,j}$	Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;	
C_o	dead wood/litter stock, under the old land-use category, tonnes C ha-1.	Deforestation

The explanation on how these were estimated is provided in the following tables.

Table 21: Aboveground biomass in forest type j

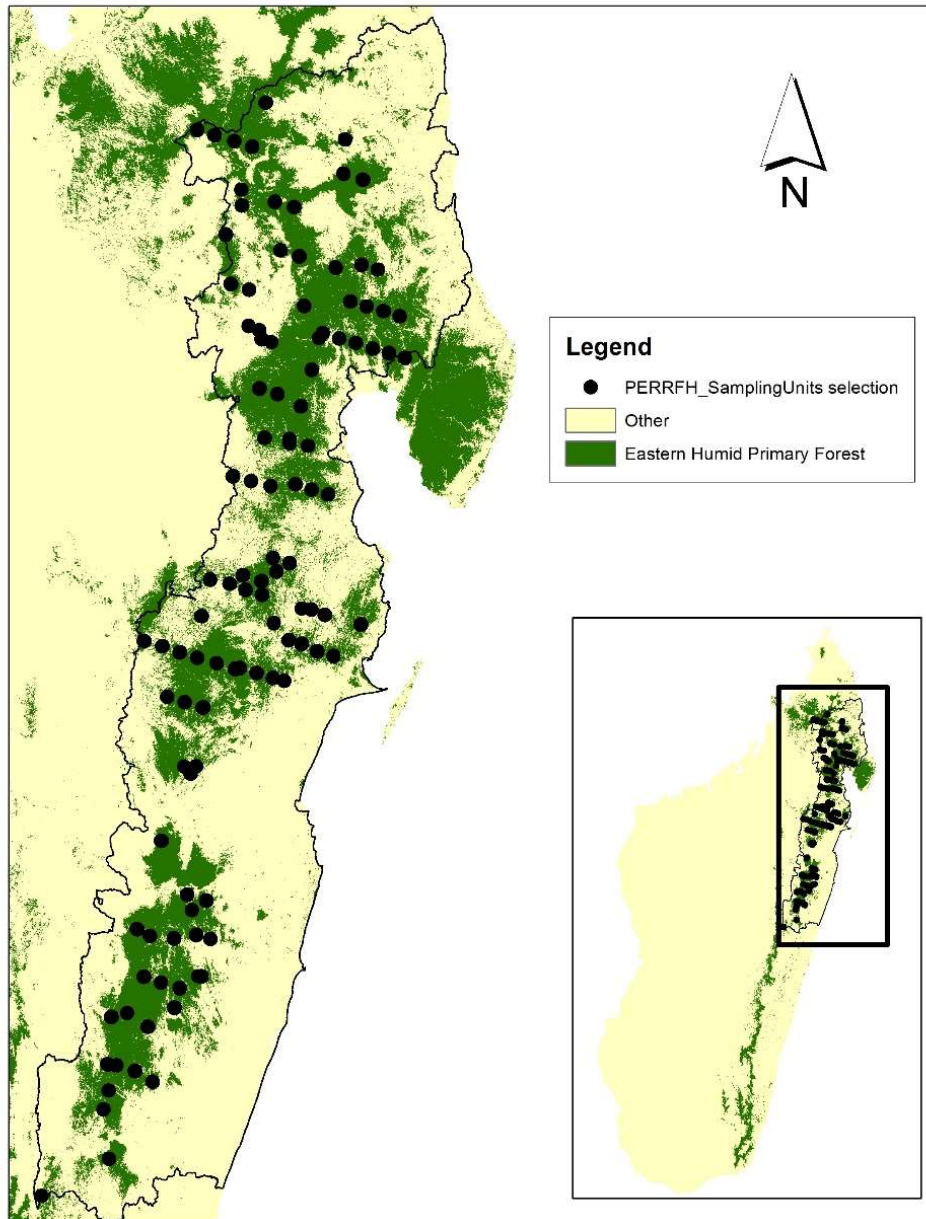
<i>Description of the parameter including the forest class if applicable:</i>	$AGB_{Before,j}$ - Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;	
	$AGB_{After,j}$ - Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;	
	$AGB_{Before,j}$ - Aboveground biomass of non-forest type j before conversion, in tonne of dry matter per ha;	
	$AGB_{After,j}$ - Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;	
<i>Data unit (e.g. t CO₂/ha):</i>	tdm/ha	
<i>Value for the parameter:</i>	Primary Forest (PF)	251.03
	Modified Natural Forest – Disturbed Forest (DF)	170.97
	Modified Natural Forest – Secondary forest (SF)	85.66
	Plantations – Agroforestry (DF)	87.87

⁷⁸ Chapter 5 of the GFOI MGD Version 2.0

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 source is primarily two different inventories:

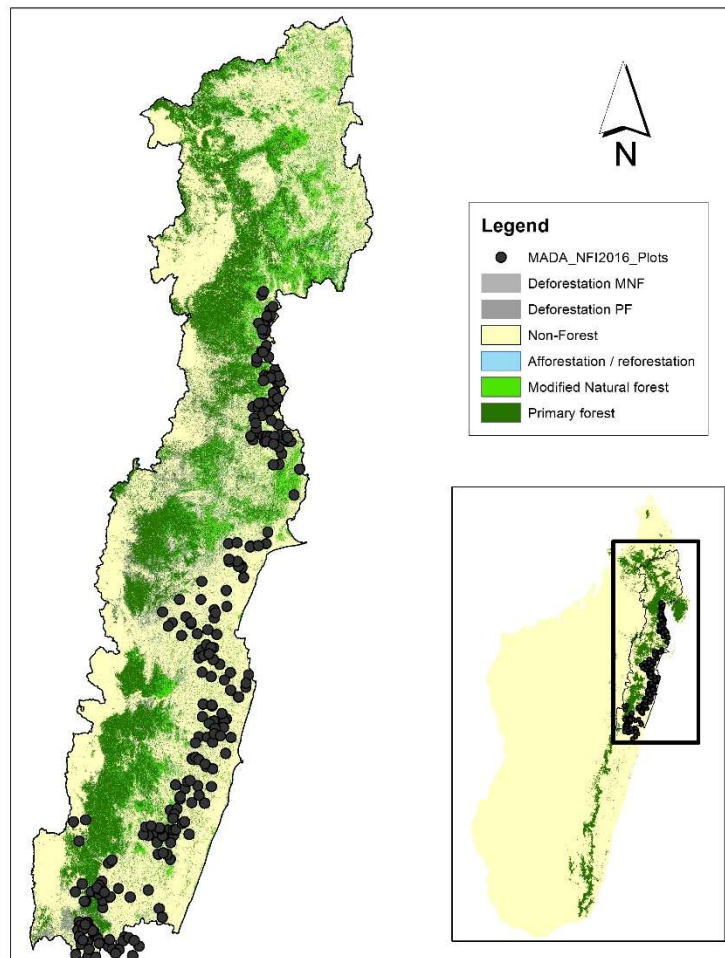
- Primary forest: As part of the PERR-FH project, intact forest were measured in 2014 using a total of 189 located within the Ecoregion of the Eastern Humid Forests



- Modified Natural Forest and plantations: Since the PERR-FH did not cover secondary formations, an inventory was conducted in 2016 by DVRF targeting the following secondary forests: Agroforestry; Ravenala mixte; Ravenala; Single layer; Savoka vieux. Definitions of each of these forests may be found in Annex. A total of 262 plots were measured. From all these formations, the single layer represents a more mature formation, which usually is the result of degradation of primary forest or old secondary forest. The other formations are secondary formations generally created after slash of primary forest. These formations have a similar stock of aboveground biomass, so Ravenala,

Ravenala mixte and Savoka vieux has been decided to be merged into the secondary forest class.

Stratum	AGB (tdm/ha)	Relative margin of error at 90% of confidence level
Agroforestry	87.87	15%
Ravenala mixte	96.08	17%
Ravenala	63.43	14%
Single layer	170.97	10%
Savoka vieux	94.62	18%
Toutes sauf SL	87.87	15%



The following sections include a description on how these data were processed and the above values were derived.

A/ Processing Workflow

Inventory data was processed as follows.

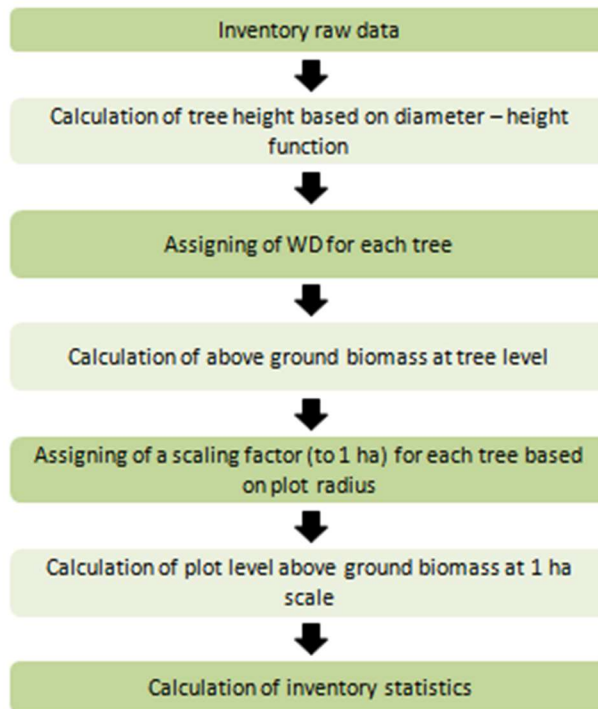


Figure 23: Inventory data processing workflow

Inventory data used to calculate ground biomass was selected as follows:

- (Woody) trees of dbh ≥ 5 cm;
- All of the Palm (*Ravenala madagascariensis* and *Dypsis sp.*).

B/ Height calculation

Allometric equations used to calculate tree biomass usually have for variable the height (total height in the case of trees, total height or trunk height in the case of the palms. The height not having been systematically measured for all trees, equations were built in order to complete the missing data.

The tree height data of trees collected in the field data was used to develop a height diameter relation based on a function proposed by Chave et al. (2014). According to the field stratum, several height-diameter relations have been established. The table below shows the relations that were developed, the corresponding stratum, the number of trees used to build this relation, as well as the relative error.

For the particular case of the Palm, specific relationships were also established in order to complete the data in the rare case where the height was not measured:

- Either to measure the total height (in the case of the *Ravenala madagascariensis*), from the height of the trunk or from diameter at height of collar (DHC) depending on available data

- Or to measure the height of the trunk (in the case of the *Dypsis sp.*), from the total height.

Table 22: Relations used for calculating heights

STRATA	N°	EQUATION	NUMBER OF TREES
Primary Forests –PERR-FH 2014 Inventory	1	$\ln(H) = -0.07511 \cdot \ln(D)^2 + 0.988 \cdot \ln(D) + 0.267$	1,270
« Savoka vieux » or « Agroforestry » strata of the 2016 inventory	2	$\ln(H) = -0.0709 \cdot \ln(D)^2 + 0.9257 \cdot \ln(D) + 0.371$	1,365
« Mix Ravenala » strata of the 2016 inventory	3	$\ln(H) = -0.106 \cdot \ln(D)^2 + 1.1305 \cdot \ln(D) + 0.0097$	499
Palm: <i>Dypsis sp.</i>	4	$H_{\text{stip}} = 0.3772 \cdot H + 1.7639$	25
Palm: <i>Ravenala madagascariensis</i>	5	$\ln(H) = -0.0699 \cdot \ln(\text{DHC})^2 + 0.9956 \cdot \ln(\text{DHC}) - 0.8902$	1,010
	6	$H = 0.9391 \cdot H_{\text{stip}} + 5.7537$	493

Where:

H: total height, in m

D: diameter at breast height, in cm

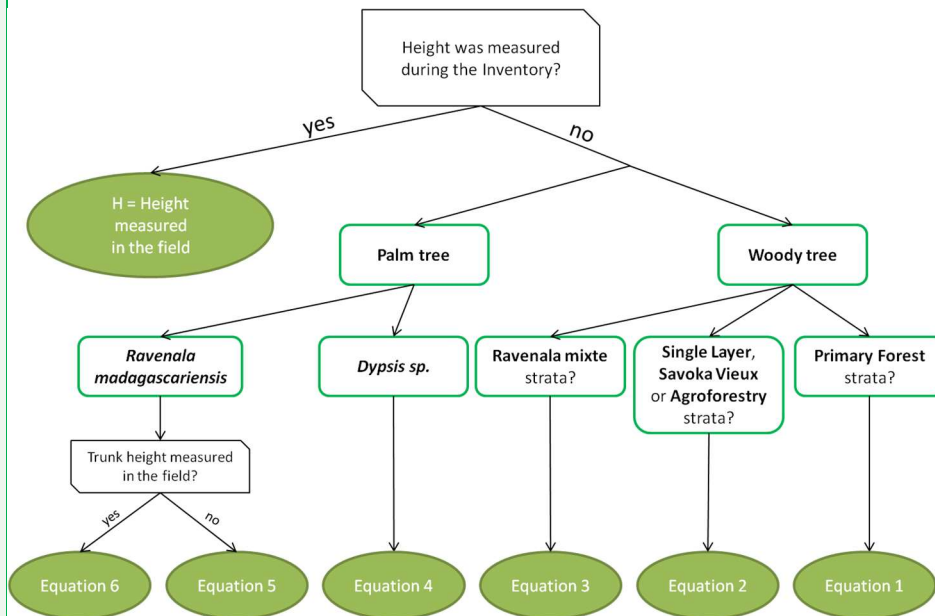
DHC: diameter at collar height (Palm trees) in cm

H_{stip} : height of the trunk (Palm trees), in m

Later in the calculations, this calculated height by tree has been used only for trees which were not measured in height on the ground: in other cases, it is the measured height that was used.

The choice of the relation to be used to calculate the height is illustrated by the decision tree shown in Figure 2 below.

Figure 24: Decision tree to calculate height



C/ Wood density assignation

Specific basal densities of inventoried trees have been already compiled by the PERR-FH project for the dense forest strata (2014 inventory). For the few additional species not listed in this database, wood density (WD) values were attributed according to the decision tree shown in the following figure:

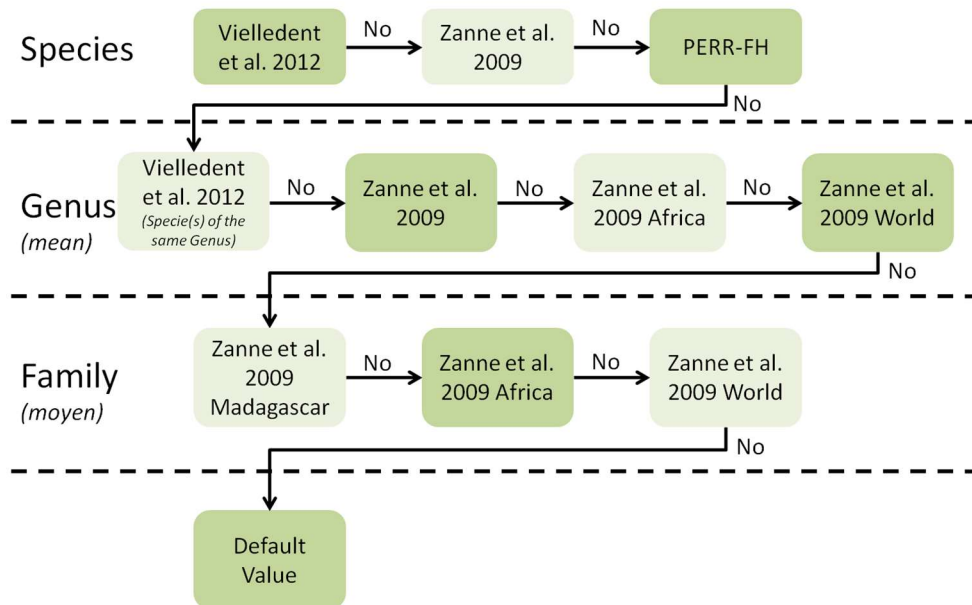


Figure 25: Decision tree for assigning WD

Wood densities were assigned based on the following 3 main databases:

1. A wood density database compiled by Vielliedent et al. (2012) for research related to allometric equations
2. The global wood density database compiled by Zanne et al. 2009
3. The PERR-FH wood density database compiled by the PERR-FH project for the purpose of the PERR-FH inventory

In the order of the above appearance, these 3 databases were searched for a WD value at the species level. If no WD value was found or only the genus of the tree was known, then WD values were assigned based on the genus in the following order of priority:

1. WD value from a species of the same genus from the database of Vielliedent et al. (2012)
2. Mean WD across the genus for species found in Madagascar from the database of Zanne et al. 2009
3. Mean WD across the genus for species found in Africa from the database of Zanne et al. 2009
4. Mean WD across the genus from the entire database of Zanne et al. 2009

In cases where only a single species of the same genus was found, the WD of this species was assigned.

If no WD value was available at the genus level or only the family of the tree was known, then WD values were assigned based on the family in the following priority order:

1. Mean WD across the family for species found in Madagascar from the database of Zanne et al. 2009
2. Mean WD across the family for species found in Africa from the database of Zanne et al. 2009
3. Mean WD across the family from the entire database of Zanne et al. 2009

Finally, if no wood density could be assigned through the above process either because no WD data was available or the tree could not be identified then a conservative WD default value of 0.5 was assigned (this value was chosen because it corresponds to the default value used in the PERR-FH project)/

D/ Calculation of AGB at tree level

The tree level biomass was calculated based on the following allometric equation (Erreur ! Source du renvoi introuvable.).

Table 23: Allometric equations used to calculate ground biomass

STRATA OR SPECIES	EQUATION	SOURCE
-------------------	----------	--------

Trees (woody)	Primary forests (PERR-FH 2014 inventory), modified forests ('Old Savoka' or 'Agroforestry' strata of the 2016 Inventory)	$\ln(AGB_{est}) = -1.948 + 1.969 \cdot \ln(D) + 0.66 \cdot \ln(H_{tot}) + 0.828 \cdot \ln(\rho)$	Vieilledent et al. (2012)
	(woody) trees of modified forests (« Ravenala mixte » strata of the inventory)	$\ln(AGB_{est}) = -1.56 + 1.912 \cdot \ln(D) + 0.471 \cdot \ln(H_{tot}) + 0.732 \cdot \ln(\rho)$	Ramananantondro et al., 2017
Palms	<i>Ravenala madagascariensis</i>	$\ln(AGB_{est}) = -5.08 + 5.654 \cdot \ln(H_{tot}) - 0.772 \cdot \ln(H_{tot})^2$	Ramananantondro et al., 2017
	<i>Dypsis sp.</i>	By default, the allometric equation that has been used is that of the <i>Chrysophylla sp</i> species as this was the equation which gave better results: $AGB_{est} = 0.182 + 0.498 \cdot H_{stip} + 0.049 \cdot H_{stip}^2$	IPCC 2003 LULUCF GPG, Annex 4A.2 (Delaney et al. 1999 ; Brown et al. 2001)

With:

AGB_{est} : Estimated *Above-Ground Biomass* in tdm

ρ : Wood density

D: Diameter at Breast Height (DBH), in m

H_{tot} : Total height of the tree or palm (for the palm, including fronds)

H_{stip} : Height of the trunk (stem height of the Palm, without considering the fronds)

E/ Calculation of AGB at plot level

Following the calculation of tree-level biomass, a scaling factor was assigned to each tree to scale the biomass estimate to the 1 ha scale. As each sample plot featured 4 subplots, different scaling factors were assigned based on the DBH of the tree (see **Erreur ! Source du renvoi introuvable.** for fixed area subplots).

Table 24: Scaling factor for fixed area subplots - 2014 PERR-FH forest inventory and 2016 DVRF inventory

DBH OF TREE [CM]	RADIUS OF SAMPLE	AREA OF SAMPLE	SCALING FACTOR TO 1
------------------	------------------	----------------	---------------------

	PLOT [M]	PLOT [SQM]	HA
≥15<30	10	314.16	31.83
≥5<15	4	50.27	198.94
<5cm	1	3.14	3,183.10

For trees with a DBH ≥30 cm which were measured with the Relascope (basal area factor 2), the scaling factor was calculated as follows:

$$SF = RCV * \frac{10,000}{\pi * c^2 * D^2}$$

With:

- SF is the scaling factor, dimensionless
- RCV: is the relascope counting value, dimensionless (0.5 or 1)
- c is the c-value for basal area factor 2, dimensionless (here 35.352)
- D: Diameter at Breast Height (DBH), in m

The scaling factor was then used to calculate biomass at the 1 ha scale for each tree. Then, above ground biomass was summarized by plot.

F/ Inference

The average estimate of Aboveground Biomass is estimated through the random estimator of the mean ($\hat{\mu}$):

$$\hat{\mu} = \frac{1}{n} \sum_{k=1}^n y_k$$

Where:

- y_k is the k sample estimate given by the biomass estimated per plot as described above. This is the biomass per sampling unit estimated above.
- n is the number of samples

Forest type	AGB (tdm/ha)	Number of samples
Forêt primaire	251.03	189
Forêt perturbée	170.97	79
Forêt secondaire	85.66	155
Agroforesterie	87.87	28

More information is provided in the spreadsheet "MADA_Biomasse aerienn e et Morte".

Spatial level
(local,
regional,

Local / Regional (Accounting Area)

national or international):

Discussion of key uncertainties for this parameter:

Sampling error

- DBH and height measurement errors
- Error of the diameter-height function
- Error of the wood density estimate
- Error of the allometric equation (selection of equation and parameters)
- Sampling error

Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:

The sampling error is estimated through the following formula.

$$\text{Standard error}(\hat{\mu}) = \frac{1}{\sqrt{n} \times (n - 1)} \times \sum_{k=1}^n (y_k - \hat{\mu})^2$$

Where:

- y_k is the k sample estimate given by the biomass estimated per plot as described above. This is the biomass per sampling unit estimated above;
- $\hat{\mu}$ the random estimator of the mean;
- n is the number of samples

The result is multiplied by the t-student value for the 90% confidence level in order to estimate the confidence interval. The margin of error is the half width of the confidence interval divided by the average estimate.

This has been applied for the two types of forest. The result is the following:

Class	BA (tdm/ha)	Stdev	Number of samples	SE	Relative margin of error at 90%
Forêt primaire	251.03	81.93	189	5.96	4%
Forêt perturbée	170.97	88.15	79	9.92	10%
Forêt secondaire	85.66	65.34	155	5.25	10%
Agroforesterie	87.87	40.45	28	7.64	15%

More information is provided in the spreadsheet " MADA_Biomasse aeriene et Morte ":

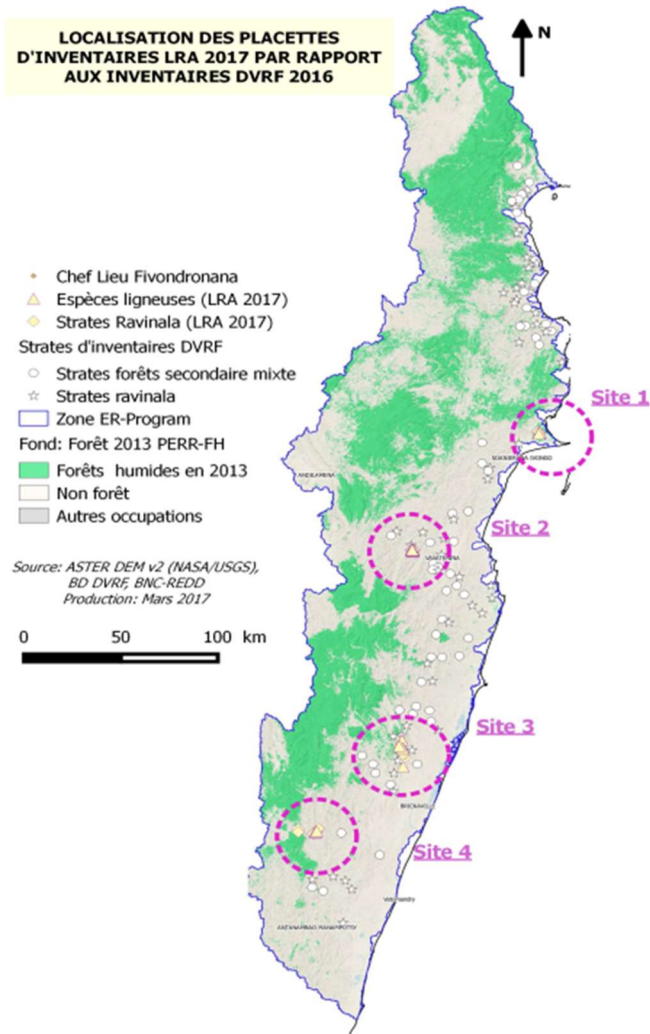
Table 25: Aboveground biomass in non-forest

Description of the parameter including

$AGB_{After,i}$ - Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;

$AGB_{Before,i}$ - Aboveground biomass of forest type i after conversion, in tonnes dry matter per ha;

<i>the forest class if applicable:</i>	
<i>Data unit (e.g. t CO₂/ha):</i>	t d.m./ha
<i>Value for the parameter:</i>	11.96
<i>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:</i>	<p>This are sourced from a destructive sampling of Savouka Jeune secondary formations conducted as part of the Laboratoire de Recherches Appliqués in 2016-2017. These formations are the precursors of Savouka vieux, revenala mix and agroforestry formations.</p> <p>A/ Sampling design</p> <p>The samples were located in four different areas, located in the Centre and the South of the ER program area. These locations are part of the regions of Analanjirofo, Atsinanana and Alaotra Mangoro. Its general characteristics are the following :</p> <ul style="list-style-type: none"> • Site 1 (Axe Soanierana Ivongo): centre of the ER program and below 200 m of altitude; • Site 2 (Axe Vavatenina): centre of the ER program and at least 400 m of altitude; • Site 3 (Axe Brickaville): south of the ER program and below 400 m of altitude; • Site 4 (Axe Andasibe): south of the ER program and above 400 m of altitude.



In each of the sites a number of 1 m² were established and they were established at different locations within watersheds in order to understand the impact of this in the aboveground biomass. Moreover, the plots within each of the slopes were located on Savouka jeune with different ages ranging from 4 to 10 years in order to understand the variability of Savouka Jeune with age. A total of 292 plots were established.

Position topographique	Site 1	Site 2	Site 3	Site 4	TOTAL
C1 : bas versant	19	27	21	22	292
C2 : mi-versant	23	26	24	24	
C3 : haut versant	19	34	27	26	
TOTAL par site	61	87	72	72	292

B/ Measurement

Within these plots, a destructive measurement of herbaceous vegetation and woody vegetation was made. The samples were then taken to laboratory and the samples were dried at a temperature of 70°C for the leaves and the herbaceous vegetation and 103°C for the shrubs until constant weight between 24 hour intervals. In general the drying

process has taken 3 days in the case of leaves and grasses, and the woody biomass has taken 5 days.



The anhydrous mass of the shrubs and grasses has been measured with a balance with 0.01 g accuracy.

C/ Statistical analysis

Different statistical analysis with packages was done on the results.

The average estimate of Aboveground Biomass is estimated through the random estimator of the mean ($\hat{\mu}$):

$$\hat{\mu} = \frac{1}{n} \sum_{k=1}^n y_k$$

Where:

- y_k is the k sample estimate given by the biomass estimated per plot as described above. This is the biomass per sampling unit estimated above.
- n is the number of samples

For the ensemble of the four sites, the biomass factor for Savoka jeunes is of 11.96 ± 6.5 t/ha.

Spatial level (local, regional, national or international):

Local / Regional (ERP area)

Discussion of key uncertainties for this parameter:

The main uncertainty is the sampling uncertainty and the representativeness of the data. See Chapter 12.

Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:

The sampling error is estimated through the following formula.

$$\widehat{\text{Standard error}}(\hat{\mu}) = \frac{1}{\sqrt{n} \times (n - 1)} \times \sum_{k=1}^n (y_k - \hat{\mu})^2$$

Where:

- y_k is the k sample estimate given by the biomass estimated per plot as described above. This is the biomass per sampling unit estimated above;
- $\hat{\mu}$ the random estimator of the mean;
- n is the number of samples.

The result is multiplied by the t-student value for the 90% confidence level in order to estimate the confidence interval. The margin of error is the half width of the confidence interval divided by the average estimate.

Class	BA (tdm/ha)	Stdev	Number of samples	SE	Relative margin of error at 90%
Non Forest	11.96		120	3.28	46%

Table 26: dead wood/litter stock

Description of the parameter including the forest class if applicable:

C_0 dead wood/litter stock, under the old land-use category, tonnes C ha⁻¹.

Data unit (e.g. t CO₂/ha):

tC/ha

Value for the parameter:

Primary Forest (PF)	5.82
Modified Natural Forest – Disturbed Forest (DF)	4.66
Modified Natural Forest – Secondary forest (SF)	2.33
Plantations – Agroforestry (DF)	2.40

Source of data (e.g. official statistics, IPCC,

The same calculation procedures as the aboveground biomass were followed, but only with the trees that were labelled in the field as dead trees. This resulted in the following:

Forest type	DW (tdm/ha)
Forêt primaire	12.38

scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:

Forêt perturbée	9.92
Forêt secondaire	4.97
Agroforesterie	5.10

These values were then multiplied by 0.47 in order to provide the carbon stocks.

More information is provided in the spreadsheet "MADA_Biomasse aerienne et Morte".

Spatial level (local, regional, national or international):

Local / Regional (Accounting Area)

Discussion of key uncertainties for this parameter:

Sampling error

- DBH and height measurement errors
- Error of the diameter-height function
- Error of the wood density estimate
- Error of the allometric equation (selection of equation and parameters)
- Sampling error

Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:

The sampling error is estimated through the following formula.

$$\widehat{\text{Standard error}}(\hat{\mu}) = \frac{1}{\sqrt{n} \times (n - 1)} \times \sum_{k=1}^n (y_k - \hat{\mu})^2$$

Where:

- y_k is the k sample estimate given by the biomass estimated per plot as described above. This is the biomass per sampling unit estimated above;
- $\hat{\mu}$ the random estimator of the mean;
- n is the number of samples.

The result is multiplied by the t-student value for the 90% confidence level in order to estimate the confidence interval. The margin of error is the half width of the confidence interval divided by the average estimate.

This has been applied for the two types of forest. The result is the following:

Class	DW (tdm/ha)	SE	Relative margin of error at 90%
Forêt primaire	12.38	0.93	12%
Forêt perturbée	9.92	1.31	22%
Forêt secondaire	4.97	0.66	22%
Agroforesterie	5.10	0.67	22%

More information is provided in the spreadsheet "MADA_Biomasse aeriene et Morte".

c. Calculation of the average annual historical emissions over the Reference Period

- i. Reducing Emissions from Deforestation / Land Use Change of Forest Land to other Land
 - a. GHG emissions in biomass

As explained in Annex V.II the annual change in carbon stocks would be estimated following **Erreur ! Source du renvoi introuvable.**:

$$\Delta C_B = \sum_{j,i} (AGB_{Before,j}x(1 + R_j) - AGB_{After,i}x(1 + R_i)) x CF x \frac{44}{12} \times A(j, i)$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b

	Activity Data (ha/year)	AGB before (tdm/ha)	AGB after (tdm/ha)	Root-to-shoot ratio forest	Root-to-shoot ratio non-forest	CF, tonne C (tonne d.m.)-1.	Conversion	tCO2/year
Primary forest	1,738.4	251.0	12.0	0.24	0.2	0.47	3.67	889,548
Disturbed forest	29,272.6	171.0	12.0	0.24	0.2	0.47	3.67	9,971,069
Secondary forest	8,147.5	85.7	12.0	0.2	0.2	0.47	3.67	1,241,779
Agroforestry	300.4	87.9	12.0	0.2	0.2	0.47	3.67	47,159
TOTAL								12,149,555

- b. GHG emissions in Dead wood and Litter

As explained in Annex V.II the annual change in carbon stocks would be estimated following **Equation 5**:

$$\Delta C_{DOM} = \frac{(C_n - C_o) \times A(j, i) \times \frac{44}{12}}{T_{on}}$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b:

	Activity Data (ha/year)	Stock litere de C dans la forêt (tC/ha)	C stocks dead wood before (tC/ha)	Stock litiere de C dans non forêt (tC/ha)	C stocks dead wood after (tC/ha)	Conversion	Years	tCO2/year
Primary forest	1,738.4	2.1	5.8	-	-	3.67	1.0	50,467
Disturbed forest	29,272.6	2.1	4.7	-	-	3.67	1.0	725,615
Secondary forest	8,147.5	2.1	2.3	-	-	3.67	1.0	132,490
Agroforestry	300.4	2.1	2.4	-	-	3.67	1.0	4,952
TOTAL								913,524

c. GHG emissions in SOC

As explained in Annex V.II the annual change in carbon stocks would be estimated following Equation 5:

$$\Delta C_{SOC} = \frac{\sum_{c,s,i} SOC_{REF_{c,s,i}} \times (1 - F_{LU_{c,s,i}} \times F_{MG_{c,s,i}} \times F_{I_{c,s,i}}) \times A_{c,s,i} \times \frac{44}{12}}{D}$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b:

	Activity Data (ha/year)	SOCref (tC/ha)	FLU	FMG	FI	D	Conversion	tCO2/year
Primary forest	1,738.4	47.0	0.8	1.2	0.9	20	3.67	23,857
Disturbed forest	29,272.6	47.0	0.8	1.2	0.9	20	3.67	401,715
Secondary forest	8,147.5	47.0	0.8	1.2	0.9	20	3.67	111,811
Agroforestry	300.4	47.0	0.8	1.2	0.9	20	3.67	4,123
TOTAL								541,506

d. Non-CO2 emissions

As explained in Annex V.II the annual non-CO2 emissions from fires would be estimated following Erreur ! Source du renvoi introuvable.:

$$L_{fire} = A(j, i) \times AGB_{Before,j} \times C_f \times (G_{ef_{ch_4}} \times G_{CH} + G_{ef_{N_2O}} \times GWP_{N_2O}) \times 10^{-3}$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b:

	Activity Data (ha/year)	AGB before (tdm/ha)	Cf - combustion factor, dimensionless	Gef-CH4-emission factor, g kg-1 dry matter burnt.	Gef-N2O-emission factor, g kg-1 dry matter burnt.	Global warming potential CH4	Global warming potential N2O	tCO2/year in Reference Period
Primary forest	1,738.4	251	0.32	7	0	21	298	28,264
Disturbed forest	29,272.6	171	0.32	7	0	21	298	324,155
Secondary forest	8,147.5	86	0.32	7	0	21	298	45,203
Agroforestry	300.4	88	0.32	7	0	21	298	1,710
TOTAL								399,332

ii. Reducing emissions from forest degradation / Forest Land remaining Forest Land

As explained in Annex V.II the annual change in carbon stocks would be estimated following Equation 9:

$$\Delta C_B = \sum_{j,i} (AGB_{Before,j}x(1 + R_j) - AGB_{After,i}x(1 + R_i)) x CF x \frac{44}{12} \times A(j, i)$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b.

	Activity Data (ha/year)	AGB before (tdm/ha)	AGB after (tdm/ha)	Root-to-shoot ratio forest	Root-to-shoot ratio non-forest	CF, tonne C (tonne d.m.)-1.	Conversion	tCO2/year
Primary forest to Disturbed forest	10,943.6	251.0	171.0	0.24	0.24	0.47	3.67	1,872,050
Primary forest to plantation	0	251.0	87.9	0.24	0.2	0.47	0.00	-
TOTAL								1,872,050

iii. Enhancement of carbon stocks in new forests / Land Use Change from non-Forest Land to Forest

As explained in Annex V.II the annual change in carbon stocks would be estimated following Erreur ! Source du renvoi introuvable.:

$$\Delta C_B = \sum_{j,i} \frac{(AGB_{Before,i} - AGB_{After,j})}{\text{Years growth}} x(1 + R)x CF x \frac{44}{12} \times A(i, j)$$

Using the default values explained in Annex V.II and the estimated values in 8.3.b.

Secondary forest

Year	Activity Data (ha/year)	AGB before (tdm/ha)	AGB after (tdm/ha)	Root-to-shoot ratio forest	CF, tonne C (tonne d.m.)-1.	Years	Conversion	tCO2/year
1	3,522.3	12.0	85.7	0.2	0.47	15	3.67	(35,789)
2	7,044.6	12.0	85.7	0.2	0.47	15	3.67	(71,579)
3	10,566.9	12.0	85.7	0.2	0.47	15	3.67	(107,368)
4	14,089.2	12.0	85.7	0.2	0.47	15	3.67	(143,157)
5	17,611.5	12.0	85.7	0.2	0.47	15	3.67	(178,947)
6	21,133.9	12.0	85.7	0.2	0.47	15	3.67	(214,736)
7	24,656.2	12.0	85.7	0.2	0.47	15	3.67	(250,526)
8	28,178.5	12.0	85.7	0.2	0.47	15	3.67	(286,315)
9	31,700.8	12.0	85.7	0.2	0.47	15	3.67	(322,104)
10	35,223.1	12.0	85.7	0.2	0.47	15	3.67	(357,894)

Agroforestry

Year	Activity Data (ha/year)	AGB before (tdm/ha)	AGB after (tdm/ha)	Root-to-shoot ratio forest	CF, tonne C (tonne d.m.)-1.	Years	Conversion	tCO2/year
1	2,479.6	12.0	87.9	0.2	0.47	15	3.67	(25,949)
2	6,001.9	12.0	87.9	0.2	0.47	15	3.67	(62,811)
3	9,524.3	12.0	87.9	0.2	0.47	15	3.67	(99,672)
4	13,046.6	12.0	87.9	0.2	0.47	15	3.67	(136,533)
5	16,568.9	12.0	87.9	0.2	0.47	15	3.67	(173,394)
6	20,091.2	12.0	87.9	0.2	0.47	15	3.67	(210,255)
7	23,613.5	12.0	87.9	0.2	0.47	15	3.67	(247,116)
8	27,135.8	12.0	87.9	0.2	0.47	15	3.67	(283,977)

Year	Activity Data (ha/year)	AGB before (tdm/ha)	AGB after (tdm/ha)	Root-to-shoot ratio forest	CF, tonne C (tonne d.m.)-1.	Years	Conversion	tCO2/year
9	30,658.1	12.0	87.9	0.2	0.47	15	3.67	(320,838)
10	34,180.4	12.0	87.9	0.2	0.47	15	3.67	(357,699)

iv. Average annual historical emissions

A summary of annual historical emissions is reported below.

- Average historical emissions from deforestation amount to **14 Million tCO2e/yr.**
- Average historical emissions from deforestation amount to **1.87 Million tCO2e/yr.**
- Enhancement of carbon stocks is **0.388 million tCO2e /yr.**

Period	historical emissions from deforestation (tCO2/yr)	historical emissions from degradation (tCO2/yr)	historical removals from enhancement of carbon stocks (tCO2/yr)	Total annual historical GHG emissions	Average annual historical GHG emissions
2005-2006	14,003,917	1,872,050	-61,739	15,814,229	15,487,301
2006-2007	14,003,917	1,872,050	-134,389	15,741,578	15,487,301
2007-2008	14,003,917	1,872,050	-207,040	15,668,928	15,487,301
2008-2009	14,003,917	1,872,050	-279,690	15,596,277	15,487,301
2009-2010	14,003,917	1,872,050	-352,341	15,523,627	15,487,301
2010-2011	14,003,917	1,872,050	-424,991	15,450,976	15,487,301
2011-2012	14,003,917	1,872,050	-497,642	15,378,326	15,487,301
2012-2013	14,003,917	1,872,050	-570,292	15,305,675	15,487,301
2013-2014	14,003,917	1,872,050	-642,943	15,233,025	15,487,301
2014-2015	14,003,917	1,872,050	-715,593	15,160,374	15,487,301

8.4. UPWARD OR DOWNWARD ADJUSTMENTS TO THE AVERAGE ANNUAL HISTORICAL EMISSIONS OVER THE REFERENCE PERIOD (IF APPLICABLE)

Not applicable.

8.5. ESTIMATED REFERENCE LEVEL

Table 27 below depicts the ER program's final Reference Emission Level. In this case, the RL is slightly different to the average historical net emissions as the removals enhancement of carbon stocks are not based on historical averages but on historical activity data (rates of afforestation/reforestation) occurring in the future.

Table 27. ER Program Reference Level

<i>ERPA term year t</i>	emissions from deforestation (tCO ₂ /yr)	emissions from degradation (tCO ₂ /yr)	removals from enhancement of carbon stocks (tCO ₂ /yr)	Total Reference Level (tCO ₂ /yr)
1	14,003,917	1,872,050	-61,739	15,814,229
2	14,003,917	1,872,050	-134,389	15,741,578
3	14,003,917	1,872,050	-207,040	15,668,928
4	14,003,917	1,872,050	-279,690	15,596,277
5	14,003,917	1,872,050	-352,341	15,523,627

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

a. *Consistency with national GHG inventory*

Madagascar submitted its initial communication in 2004 and the second communication in 2010, but has not submitted a Biennial Update Report so far. The national communication of 2010 refers to the year 2000. The approach used in the 2010 inventory for estimating the emissions and sinks of the forestry sector, are similar to those used in 2017 for estimating the emissions of the ER-P area and the emissions on national scale, however there are differences on the following parameters:

- The national inventory uses the base year 2000, whereas the ER-P REL considers a reference period of 2005 to 2015. It is clear that one single year (2000), is too short to serve as reference period and lies too far in the past, and hence could not be considered for the development of the REL.
- The national GHG inventory considers the land use change from forest to non-forest land, but ignores finer classifications such as e.g. primary forest or modified natural forests and related land use change. However, the ER-P chose to consider such classes in order to be able to apply more specific emission factors, increasing the overall accuracy.
- GHG Inventory considers the GHGs CO₂, CH₄ and N₂O, whereas the ER-P REL considers only CO₂. This is related to the issue that the LULUCF inventory was built around a dataset covering the burning of biomass and hence such data is available for the year 2000. However, with respect to the reference period, the analysis applied for estimating the activity data did not result in clear

indications of areas burnt and hence forest IPCC fire modules, which could have allowed for estimating CH₄ and N₂O emissions could not be applied.

Madagascar is in the process of establishing a national forest monitoring system which will be spearheaded by the 'laboratoire géomatique' hosted under BNC REDD+. The laboratory will develop i) activity data and ii) derive emission factors, once new underlying data will become available, i.e. new, additional volume data, identification of additional tree species names (which is currently perceived as a weakness of the national forest inventory) and/or the identification of additional tree species specific density factors.

The GHG inventory and the national communications are prepared by BNC CC. As the national forest monitoring system, led by the laboratory, will produce activity data as well as new emission factors, the laboratory will provide such data to BNC CC, which will ensure consistency of data used for the GHG inventory.

b. *Consistency with national REL*

On behalf of Madagascar, BNC REDD developed its Forest Reference Emission Level / Forest Reference Level (FREL/FRL) and submitted it to UNFCCC in 2016. The submission is primarily based on existing data, not generated as part of the REDD readiness process, and the main objective for this was to learn from the process and extract lessons learned that could feed into the design of the emerging NFM. The FREL/FRL is currently under evaluation by the UNFCCC Secretariat. Recommendations from UNFCCC that result from the validation process may lead to amendments in the national FREL.

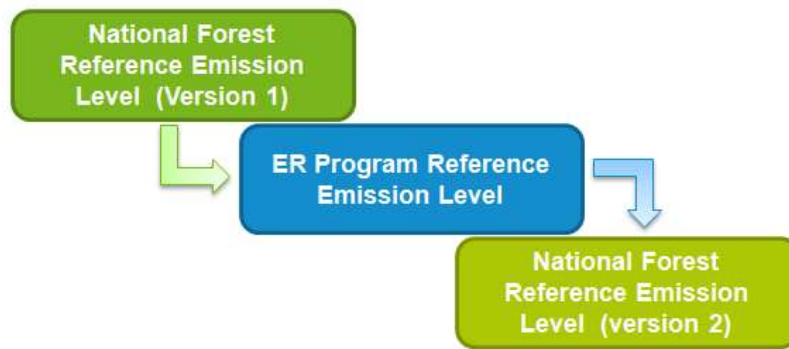
Both analyses correspond largely. The products match in terms of carbon pools and GHGs considered. Moreover, both constrain their analysis to the detection of the land use change from forest to non-forest as well as regrowth. However, there are some differences between the national FREL and the ER-P REL with respect to technical design features, which are summarized as follows:

- The national FREL/FRL covers a reference period from 2000 to 2013. However, the ER-P covers a reference period from 2005 to 2015 as required by the Methodological Framework, Criterion 11.
- The national FREL covers four ecosystems including the ecosystem of humid forests as covered by the ER program area. In order to estimate the total emissions of the forestry sector, the national REL employs ecosystem-specific inventory data. The ER program however does not cover the total ecosystem of humid forests. Consequently, for the determination of the emission factors, we used only such plot data which is located within the boundaries of the ER Program. Moreover, the ER Program uses a different stratification (including primary forests and modified natural forests) and includes new inventory data from plots located in the ER Program area, aiming to measure the biomass stock of degraded forests. As a consequence, there are slight differences between the emission factors for humid forests used on national scale and the emission factors used in the ER Program, despite addressing the same ecosystem.

On more general terms, as specified in the National Forest Reference Emission Level, it is envisaged that the ER Program REL, being more specific and accurate, informs the national REL.

The process of developing the initial FREL, its validation as well as the development of the ERP REL insights on learning processes. It is envisaged that, once the laboratory is up and running, that Madagascar develops a revised national FREL (including the ER Program area) which would build on past learning

processes, and which would have a reference period which is consistent with the current reference period of the ER REL.



9. MEASUREMENT, MONITORING AND REPORTING APPROACH FOR ESTIMATING EMISSIONS OCCURRING UNDER THE ER PROGRAM WITHIN THE ACCOUNTING AREA

a. Overall structure of FMS

The Forest Monitoring System (FMS) of the ER-Program will be fully integrated in the emerging National Forest Monitoring System (NFMS). This NFMS was established in accordance to the decision 4/C.15 of Copenhagen and it has two main functions: a monitoring function and a Measurement, Verification and Verification (MRV) function.

The **monitoring function** will serve for the monitoring of legal compliance, safeguards and other aspects of the ER-Program. The **MRV function** of the NFMS, is strictly related to estimation, reporting and verification of GHG emissions and removals.

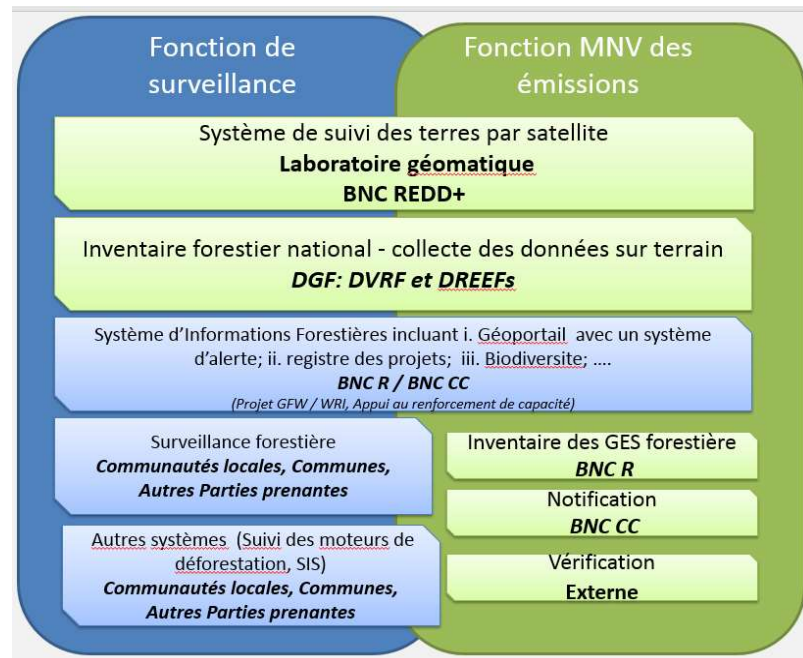


Figure 26. Structure of the NFMS

b. Principles of the FMS design

The emissions by sources and removals by sinks measured, monitored and reported by the FMS will be consistent with those reported by the RL as required by **Criterion 14 of the methodological framework**. This will be done through four main principles:

- **Consistent scope:** The same scope in terms of geographical area, REDD+ activities, carbon pools and GHG gases will be kept with regard to the RL (Indicator 14.1 of the CF MF);

- **Activity Data (AD):** The data on the magnitude of human activity resulting in emissions or removals taking place during a given period of time, will be measured and monitored following the same methods used for the defining this in the RL (Indicator 14.2 of the CF MF);
- **Emission Factors (EF) and default values:** The same EFs and default values used for the RL will be used in the estimation of GHG emissions by sources and removals by sinks (Indicator 14.3 of the CF MF);
- **GHG accounting:** The same equations, calculation procedures and QA/QC as used for the RL will be used (Indicator 14.1 of the CF MF).

This would mean that the only parameters being modified with regard to the RL would be the AD. Considering the methods described in Chapter 8.3, this would mean that only one parameter would be measured:

	Activity Data	Source
$A(j, i)$	Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest)	Deforestation
$A(j, i)$	Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest)	Degradation
$A(i, j)$	Annual conversion from non-Forest Land use i to forest type j (planted forest or modified natural forest)	Enhancement of carbon stocks (afforestation/reforestation)

c. Measurement, Monitoring and Reporting Process

The general measurement, monitoring and reporting process consists in all operations of data collection of EO data, QA operations, and final reporting. A general overview of the FMS process is provided in the following simplified process diagram. Each of the operations is described in the following sections.

Data Collection and Processing

Data collection and processing will be done in order to produce Activity Data which will be in the form of area of conversion of land use subcategories / strata ($A(j, i)$, $A(i, j)$). The main specifications for data collection and processing are provided in the following table.

Table 28. Parameters to monitor

Parameter:	$A(j, i)$ $A(i, j)$
Description:	<ul style="list-style-type: none"> • Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest) in the monitoring period • Annual conversion from forest type j (primary forest), to forest type i (modified natural forest and plantations) in the monitoring period • Annual conversion from non-Forest Land use i to forest type j (planted forest or

	modified natural forest) in the monitoring period
Data unit:	ha/year
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>Similarly, to the reference level, design based inference will be used in order to estimate the activity data. The design still has to be defined, but here it is assumed that an independent sample will be collected.</p> <p>Sampling design</p> <p><u>Estimator:</u> Stratified random estimator of a proportion</p> <p><u>Stratification:</u> A forest cover change map reflecting changes in the monitoring period will be used for stratification purposes. The following classes will be defined, but further stratification might be done if it reduces the standard errors.</p> <div style="background-color: #e0f0e0; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Classes</p> <ol style="list-style-type: none"> 1. Primary forest 2. Modified Natural Forest 3. Deforestation of Primary Forest 4. Deforestation of Modified Natural Forest 5. Afforestation/reforestation of Modified Natural Forest 6. Afforestation/reforestation of Forest Plantations 7. Others </div> <p><u>Precision and confidence level:</u> Relative margin of error of 10% at 90% of confidence level</p> <p><u>Calculation of number of samples:</u> For the calculation of the number of samples, the equation from Cochran (1977, Eq. (5.25)) was used assuming that the cost of sampling each stratum is the same:</p> $n = \frac{(\sum W_h S_h)^2}{[S(\hat{O})]^2 + (1/N) \sum W_h S_h^2} \approx \left(\frac{\sum W_h S_h}{S(\hat{O})} \right)^2$ <p>Where:</p> <p>W_h Weight of stratum i;</p> <p>S_h Standard deviation of variable of interest in stratum i;</p> <p>$S(\hat{O})$ Standard error of the variable of interest;</p> <p>N Number of sampling units in the region of interest (i.e., population size);</p> <p>Response design</p> <p><u>Spatial assessment unit:</u> The spatial assessment unit will be a square area of 30 meter of side adjusted to the pixel of the stratification map. However, contextual information around the pixel will be used in order to apply the minimum area specified in the forest definition (i.e. at least 11 continuous pixels with a 30% tree canopy cover) and the definition of deforestation (i.e. at least four continuous pixels with less than 30% of tree canopy cover).</p> <p><u>Source of the reference data:</u> The reference data in this case will be collected through visual interpretation of all satellite imagery available to the country. This includes:</p>

- SPOT 5: High resolution imagery (10 m resolution) for 2014/2015
- Google Earth and Bing: All high and very high resolution imagery accessible through Google Earth and Bing. The spatial coverage of very high resolution imagery in the ER program area is relatively high, with many areas with coverage from 2005 to 2016.
- Google Earth Engine: All medium and high resolution imagery available in Google Earth engine.
- Others: Other imagery that might be available.

It is considered that this is reference data as most of the interpretations will be based on direct interpretation of higher resolution imagery for different periods which provides the necessary temporal contextual information.

Reference labelling protocol

- LULC Classification system: The LULC Classification system used will be consistent with the one used for the reference level.
- Labelling protocol: The following decision tree was followed in order to label sampling units
 1. Validation class at a sampling unit level
 2. When is forest sometime during the period, does it belong to a continuous forest patch (at least 30% of tree canopy cover) larger than 1 ha? Yes, No
 3. If there has been deforestation, does it belong to a continuous non-forest (less than 30% of tree canopy cover) patch of 0.36 ha? Yes, No
 4. Quality of the interpretation: High Low

Analysis design

The average proportion of the variable of interest in the reference period will be estimated through the stratified random estimator of the mean ($\hat{\mu}_{STR}$)

$$\hat{\mu}_{STR} = \sum_h^H W_h \hat{\mu}_h$$

Where:

W_h Weight of stratum h ;

$\hat{\mu}_h$ Sample estimates within stratum h which is equal to $\hat{\mu}_h = \frac{1}{n_h} \sum_{k=1}^{n_h} y_{hk}$

where y_{hk} is the i^{th} sample observation in the h^{th} stratum

Frequency of monitoring/recording:

Biennial.

Monitoring equipment:

As shown above.

Quality Assurance/Quality

QC procedures in this case consist in the establishment of a Standard Operating Procedure (SOP) for the interpretation of the samples and the application of training

<i>Control procedures to be applied:</i>	procedures in order to ensure the correct data collection. Moreover, the interpreters indicate whether the quality of interpretation is high or low. All low samples not used for inference. QA procedures in this case consist in revisiting 10% of the samples in order to confirm the correction implementation of SOPs. Moreover, an external person to this has checked the consistency of the data.
<i>Identification of sources of uncertainty for this parameter</i>	Possible uncertainties in this case would be as follows: <ul style="list-style-type: none"> ▪ Measurement uncertainty ▪ Sampling uncertainty
<i>Process for managing and reducing uncertainty associated with this parameter</i>	See above.
<i>Any comment:</i>	Community monitoring is not envisaged for this parameter.

Calculation

In order to execute this operation of the process, the same IPCC methods and equations described in Chapter 8.3 will be used to estimate GHG emissions in the monitoring period.

Once changes in carbon stocks under the ER-Program are estimated for each activity i ($\Delta C_{LU,i}$), it would be necessary to determine the GHG emission reductions that would be generated by the program. The following equations would be applied:

$$ER_{LU} = \sum_i \sum_t^T (RL_{i,t} - \Delta C_{LU,i} \times T) \quad \text{Equation 1}$$

Where:

- ER_{LU} = GHG emission reductions; tCO₂e year⁻¹.
 $RL_{i,t}$ = GHG emissions of the RL in REDD+ activity i in year t ; tCO₂e year⁻¹.
 T = Years in monitoring period, year

The uncertainty of the GHG emissions reductions would have to be estimated through Montecarlo methods as described in the 2006 IPCC GL – Volume 1 – Chapter 3. The final uncertainty reported under the FCPF CF MF for deforestation and degradation,⁷⁹⁸⁰ will serve to define the conservativeness factor to be applied in order to define the amount set aside in the buffer reserve.

Table 29. Conservativeness factors to be applied to Emission Reductions as defined by the FCPF CF MF

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⁸⁰ Only if spatially explicit activity data (IPCC Approach 3) and high-quality emission factors (IPCC Tier 2) are used, i.e. Approach 3. Criterion 22 of the FCPF CF MF.

Aggregate Uncertainty of Emissions Reductions	Conservativeness Factor
= 15%	0%
> 15% and = 30%	4%
> 30 and = 60%	8%
> 60 and =100%	12%
> 100%	15%

$$ER_{LU} = \sum_i \sum_t^T (RL_{i,t} - \Delta C_{LU,i} \times T) \times (100 - CF_i)/100 \quad \text{Equation 2}$$

Where:

CF_i = Conservativeness factor for REDD+ activity i ; percentage.

Reporting

Once the emission reductions are calculated, these will be reported providing all information in a transparent way demonstrating that the principles set in Chapter 9.1 have been followed. The following information will be reported:

- Reporting of parameters measured and monitored;
- Total emission reductions;
- Emission reductions disaggregated:
 - REDD+ activity and sub-activity
 - Per participant in the benefit sharing mechanism.
- Existence of reversals

9.1. ORGANIZATIONAL STRUCTURE FOR MEASUREMENT, MONITORING AND REPORTING

a. *Organizational structure, responsibilities and competencies*

The government of Madagascar is in the process of establishing a National Forest Monitoring System (NFMS) which also fulfils the functions of monitoring and reporting the future emissions and possible emission reductions of the country's ER Program. The monitoring system is based on the following key elements:

- BNC REDD assumes the overall responsibility for the future assessment of land use change and the development of the ERP monitoring report. This not only holds true for FCPF related reporting but also for the reporting of the net GHG emissions from the forestry sector on national scale. The underlying remote sensing analyses will be conducted by a remote sensing laboratory which is currently being created under the mandate of BNC REDD+. This laboratory will determine activity data for the ER Program (following the procedures specified in Chapter 9.1) and equally will determine the activity data to monitor emissions and removals at national scale.

BNC REDD equally hosts a REDD+ project register which ensures standardized data flow from REDD+ projects in the ER Program area (i.e. VCS projects CAZ and Makira) and on national scale to BNC REDD+ Data comprises monitoring results, loss events as well as carbon sales to ensure the avoidance of double counting).

- BNC REDD will provide the national data (i.e. activity data, emissions factors and information on mitigation actions in the forestry sector) to BNC CC in order to be used in the national GHG inventory and the submission of National Communications and Biennale Update Reports to UNFCCC.
- DGF (including DVRF which is charged with the implementation of the national forest inventory) will provide new inventory data to BNC REDD+, once available. A current obstacle is that inventories in Madagascar typically comprise a considerable number of species which are either unknown, or identified with their common names only. However, if the scientific names are unknown, this impedes the identification of species specific density parameters for the calculation of carbon stocks. To that end, DVRF and BNC REDD+ are creating a national tree species data base. Additional tree species specific information, as well as new inventory data may lead to an increase of accuracy of the carbon stock estimates and possibly, the updating of emission factors in the future.
- Local communities and REDD+ projects may provide information on performance, illegal logging activities, loss events, poaching and irregularities on in the REDD benefit sharing process. Community monitoring activities are specifically foreseen in those areas, where there is weak presence of the government. Community monitoring will be based on smart phones which are linked to a national geoportal of the NFMS. First field tests of community monitoring were conducted, and the geoportal is being developed in cooperation with Global Forest Watch.
- BNC REDD+ will compile the results of the Measurement, Monitoring & Reporting activities in a monitoring report which will be submitted to the FCPF Carbon Fund for external verification.

The organizational structure of the Monitoring, Reporting and Verification system (i.e. those functions of the NFMS which are constrained to the accounting of emissions/removals) is illustrated by the figure below.

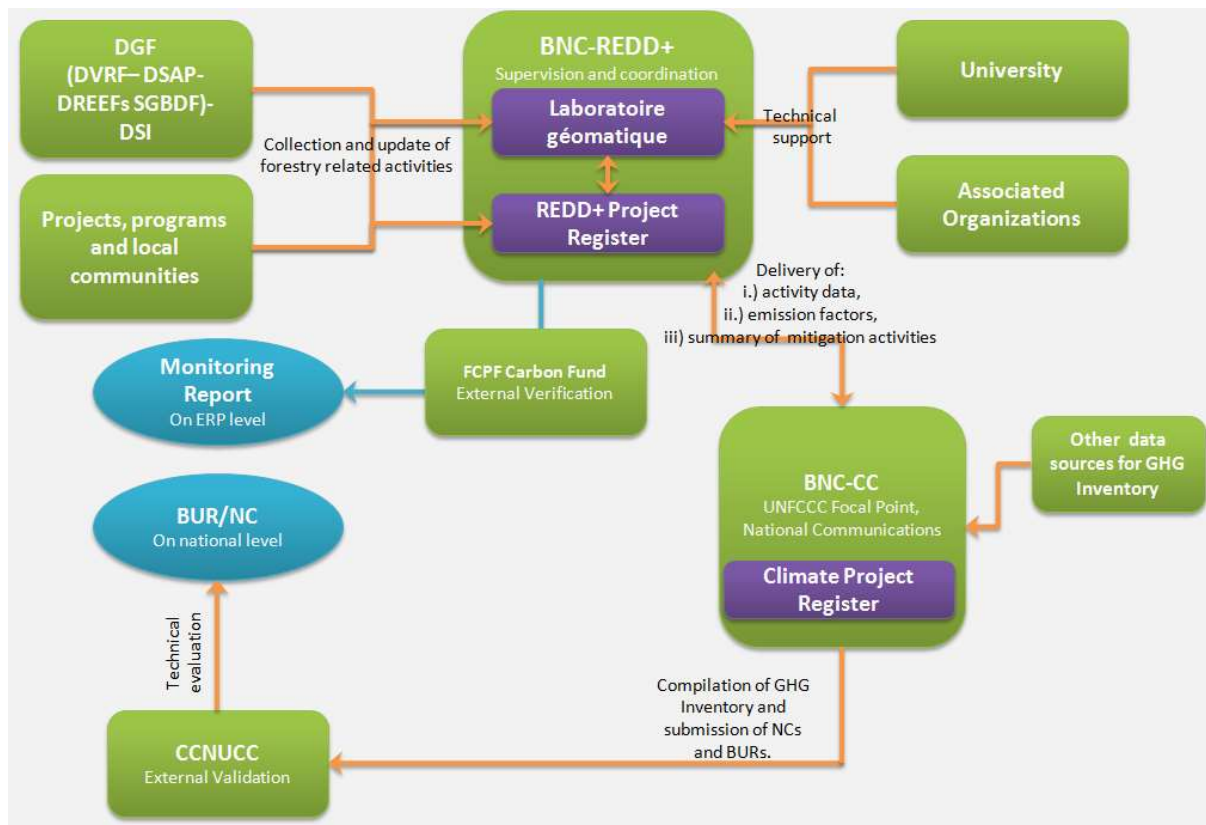


Figure 27: Organizational Structure for the Reporting of Emissions

b. Methods and standards for generating, storing, aggregating and reporting data

The monitoring data will be generated following the procedures specified in Section 9.1 and will correspond with ER Program approaches in terms of forest definition, definition of forest types, choice of activity, pre-processing and processing methods, emission factors, uncertainties of change categories and overall uncertainties etc.

The data will be stored and published in a geoportal which forms an inherent element of the NFMS. The inventory portal will be developed by the World Resource Institute in cooperation with the MEEF, spearheaded by the “laboratoire de géomatique”. This approach will ensure that the data is well stored while being publicly accessible.

c. Integration of the MMR system into existing systems

It is important to note, that up to date, Madagascar does not yet have a fully operational forest monitoring system, in which the ER Program’s Measurement, Monitoring and Reporting efforts could be integrated. However, there are the following oscultation points:

- In terms of emission factor related data, the ER Program’s monitoring system is based on the existing forest inventory system comprising the national forest inventory, PERR-FH data as well as the new inventory data generated in 2016 aiming to better understand degradation and non-forest biomass.

- Moreover, the MMR will feed into the web-based geoportal, which will also feature data originating from Global Forest Watch (GFW). However, it is important to note that GFW data will not be used for the monitoring of emissions but merely for providing near real time information. This will allow to assess the performance of REDD+ activities in between of monitoring events and equally important will quickly inform on possible large loss events, which then will be validated by the ER Program on the ground.

The Measurement, Monitoring and Reporting system of the ER Program will be integrated into the national reporting system to UNFCCC. BNC CC acts as national focal point for UNFCCC and prepares National Communications, Biennale Update Reports as well as the underlying GHG inventory. To that end, BNC REDD will inform BNC CC on the following issues

- Provision of new, updated activity data;
- Information on amendments of emission factors / new underlying data;
- Summary of REDD+ measures and related forest policies, underlying efforts, results and obstacles.

This information will enable BNC REDD to integrate the data from the forestry sub-sector into the LLULUCF sector ensuring a high data quality for informing UNFCCC.

9.2. RELATION AND CONSISTENCY WITH THE NATIONAL FOREST MONITORING SYSTEM

The National Forest Monitoring System is currently being developed by key agencies of the government of Madagascar, led by MEEF. This allowed conceiving the MMR of the ER Program as inherent element of the National Forest Monitoring System which is described above. Please refer to Section 9.2.

10. DISPLACEMENT

This Section discusses the associated risk of displacement for each driver of deforestation identified in section 4.1. The analysis offers a “high/medium/low “ risk significance categorization for each driver, which is linked to the emission level impact estimated to be due to the identified displacement risk. In parallel, the analysis offers also an analysis of the geographical extent of the displacement: not identified because far from ER-P activities implementation, or close from the ER-P activities implementation and thus identified.

The fact that Madagascar is an island explains why international displacement is excluded from the analysis, first because the risks are easily estimated to be insignificant, and then because when they do exist their clear identification and description are very difficult to realize.

In the context of Madagascar, the main risks of displacement of emission related to development planned within the project area are low. The program is more likely to attract migrants into the area, which increases the risk of reversals or increased GHG emissions, but reduces the risk of movements of populations towards other provinces. The history of development projects in Madagascar has demonstrated that when projects begin to generate benefits, an immigration phenomenon is often observed in the project area. This phenomenon is related to poverty - which forces households to abandon their lands and seek opportunities where they exist. In this context, Madagascar’s proposal is designed to promote opportunities within the area of application and thus does not seem to pose a significant displacement problem out of the ER-P.

10.1. IDENTIFICATION OF RISK OF DISPLACEMENT

As explained in section 4.1, the diversity of drivers is quite important in Madagascar but some drivers appear to be responsible for the majority of deforestation:

- Agricultural expansion: annual crops and shifting cultivation named “tavy” is undoubtedly the main driver of deforestation in the ER-P area, while permanent crops have a double role because they are initially responsible for deforestation for the first implementation but they can also ensure carbon stock enhancement when settle on fallow land or post-tavy secondary forest. Then fires related to livestock breeding and the regeneration of pasture areas are often causing deforestation by spreading and burning secondary formations and degraded edge forests.
- Wood Harvesting:
 - Although there is undeniable overexploitation of certain wood species (rosewood, palissander, etc.), as well as large losses during processing (40% to 80% of the harvested wood is lost), it is also important to note that the exploitation of timber a posteriori promotes the infiltration of the villagers into the massifs by the access roads used during the exploitation, which can trigger deforestation and the subsequent degradation if these populations want to practice agriculture or livestock on these new accessible areas.
 - While fuel wood harvesting does not appear to have a significant impact on carbon stocks, charcoal production for domestic and local use can contribute to forest deforestation.
- Mining, which during the reference period could be negligible in terms of deforestation area compared with other direct drivers, is a growing activity and directly threatens the integrity of intact forests, including within the protected areas.

A reminder of the activities of the program is presented into the following table:

Category of activity	With direct impacts	With indirect impacts
Agricultural sector	<p>AD 1 - Optimize production systems and agricultural and livestock-dedicated infrastructures</p> <p>AD 2 - Improve the management of cash crop production under the agroforestry system and improve the food security of local communities' riparian to forests</p>	<p>AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at the local level</p>
Forest sector	<p>FD 1 - Improve the management of forest areas under the landscape approach</p>	<p>FI 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire management</p>

	FD 2 - Promote private and community reforestation, rehabilitate degraded forest areas, and reforest in consideration of local needs, without converting natural forests	FI 2 - Improve the contribution of the forest sector to economic development by promoting the use of non-wood products and other subsectors that do not affect the carbon stock
Energy sector	ED 1 - Promote improved fuel wood transformation and use techniques, as well as the dissemination of improved coal stoves in urban centers ED 2 - Develop the use of renewable energy (solar, biogas, etc.) for domestic use	EI 1 - Support the harmonization and development of the legal framework relating to the development of alternatives to fuel wood and sustainable fuel wood supply
Crosscutting and other sectors	ID 1 - Enhance the benefits delivered by the conservation of biodiversity and ecosystem services	II 1 - Reinforce land security, including with reforestation actors II 2 - Improve the coordination and monitoring of mining and agricultural developments and ensure the setting up of compensatory reforestation II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level II 4 - Align the legal framework with the institutional one conducive to the good governance of the REDD+ mechanism

a. *Displacement of deforestation due to Agricultural Expansion*

Driver & Agent	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk	Mitigation measures
Annual crops and shifting cultivation / Small farmers and local populations for subsistence agriculture - Emigrant population	High: Tavy system is undoubtedly the main driver of deforestation everywhere on the ER-P area, and is used mainly for annual crops	<p>Activity shifting: Displacement of shifting cultivation would require the local population to re-locate their agricultural activities outside the program, but this phenomenon is quite unlikely. Some immigrant populations may decide to relocate within the ER-P in order to access natural resources, and practice shifting agriculture. Activities FD1; FD2 and FI1 could force local population to relocate to other areas within the ER-P or outside the ER-P, but more likely to areas in close proximity within the same watershed or in an adjacent watershed. In view of this and considering the ER program low perimeter/area ratio (and that a large fraction of the perimeter leads to non-forested coastal areas or the dry forest ecoregion), any emissions due to displacement of shifting cultivation and annual crops wouldn't be high, but neither negligible.</p> <p>Market Effect: most of the agriculture within the ER program area is small scale and primarily subsistence driven. Some produce may be sold but this is primarily to serve local markets as the accessibility to large cities such as Antananarivo is limited by lack of accessible transport infrastructure. Hence no market leakage is likely to occur.</p>	Medium	<p>The ER-P is designed in a way that all activities implemented will be discussed and planned at commune and landscape scale with the participation of all stakeholders. Only large scale projects could incur a risk of displacement. The ER-P will set up procedures in order to ensure that design phase consultations of concerned communes will be undertaken and a displacement analysis and mitigation strategy will be developed.</p> <p>In addition, the ER Program incorporates a set of activities aimed at increasing agricultural productivity (AD1), diversifying incomes from natural resources (AD2) and strengthening agricultural value chains with the objective of increasing revenue of agricultural activities (i.e. without increasing production) (AI1). These activities will increase the efficiency in the use of existing agricultural land, avoiding the need to migrate due to mitigation activities within the forestry sector (FD1, FD2, FI1).</p>

Agent	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk	Mitigation measures
Permanent crops / Small farmers-Emigrant population	Medium because initially permanent crops are responsible for deforestation when traditionally implemented but they can also ensure carbon stock enhancement when settle on fallow land or post-tavy secondary forest	<p>Activity shifting: most permanent crops in the ER-P can be produced through agroforestry systems and thus it is very unlikely that some activities of the program could encourage or force local farmers to relocate their production, even more when activity AD2 aims at improving agroforestry systems and ensuring their sustainability.</p> <p>However, activity FD1 and FI1, by improving forest management and reinforcing controls, might in some extent, force local population without legal land specifically dedicated to permanent crops, to implement their production sites on existing forest lands, thus increasing deforestation - or affecting natural state of forest by implementing agroforestry systems within intact forest.</p> <p>Market Effect: The program will improve permanent crop production first by improving traditional practices in order to ensure sustainability, and also by increasing agroforestry areas on fallow lands (and ensuring carbon stock enhancement) when they have a high risk of being burnt through tavy. No market leakage risks can be thus identified in the program because the ER-P aims at improving productivity by encouraging sustainability.</p>	Medium	The displacement risk related to emigration will be monitored during each project design phase (and thus included in the Regional REDD+ Activity Plan) and a specific strategy will have to be designed in order to anticipate potential negative impacts.

Driver & Agent	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk
Fire due to pastoralism and small farmers with beef cattle	Medium	Activity shifting: If improved forest management or new reforestation (activities FD1 and FD2) could constrain the access to land, thus causing activity shifting, it is considered as highly unlikely that local farmers would relocate outside the ER program area because (i) mobility of farmers with beef cattle is very limited, and (ii) activity AD1 aims at compensate potential constraint by improving cattle breeding practices. No risk identified.	No risks

		Market Effect: ER-P activities dedicated to cattle breeding and fire management practices will not affect the overall level of productivity, and thus risk of market leakage is negligible.	
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b. Displacement of deforestation due to wood harvesting

Driver / Agent	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk	Mitigation measures
Construction, softwood and service timber harvesting / Artisanal loggers without authorization from forest administration	Low, because illegal and artisanal logging is only focused on some species	<p>Activity shifting: Unlike for local populations, artisanal logging is not linked to land property; loggers may move to other regions when affected by the program activities aimed at reducing artisanal and illegal logging. Thus, a risk of displacement of artisanal and illegal logging in some areas within the ER-P exists where you can find equivalent high-value wood species (rosewood, palissander). However, due to geographical and topographic constraints but also to a further distance from the coast (where all illegal timber is exported), it seems minimally feasible for artisanal loggers to move in the humid forest located on the west side of the ER-P (Bealanana) for wood exploitation.</p> <p>Market Effect: The ER-P should reduce its timber supply through a limitation of illegal and artisanal logging. Thus, the supply gap may be closed by other agents in other areas of the humid forest ecoregion.</p>	Medium	<p>The ER Program will not try to reduce artisanal logging but will only ensure that logging is realized legally. Specifically, the ER Program pursues the following strategy:</p> <ul style="list-style-type: none"> - Activity FD1 will improve forest management by developing local landscape plans, in which some areas will be dedicated to logging and ensure sustainable artisanal logging operations. - Activity FD2 will mitigate the risk of displacement in the mid-term by the creation of dedicated afforestation activities according to local needs, including for timber supply. - Activity FI2 will support the development of partnership between local community and artisanal loggers in order to determine the demand in timber wood and then support the creation of sustainable artisanal logging operations for its supply.

Driver & agent	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk
Wood fuel / charcoal production due to local population	Medium Although the consumed charcoal mainly comes from eucalyptus plantations, in some part of the ER-P area, charcoal has a more important local impact, in particular due to the increase in the demand from certain urban areas (ex. Fénériver Est)	<p>Activity shifting: Charcoal is mainly produced from eucalyptus plantations but also in lower extent from natural forest, mostly as a byproduct of shifting cultivation. The wood which is cut for future agricultural land is also used for charcoal production.</p> <p>The ER-P programs aims at improving carbonization practices of charcoal made from specific plantations in order to improve energy efficiency; activity FD2 will promote plantations dedicated to charcoal supply.</p> <p>However, there is a risk that activities FI1 could force illegal producers to relocate in other areas. But considering that urban areas responsible for a high demand in charcoal are coastal, and considering also the topography of the ER-P area, there is no risk that producers would relocate outside of the ER-P to produce charcoal.</p> <p>Market Effect: The ER Program does not aim to reduce the existing charcoal supply but to size the production to the current and near-future demand (potentially increase the production through specific plantations) and improved carbonization practices and so improve energy efficiency. By doing so the ER-P should be able to ensure the needs from urban areas within the program reducing the risk of market leakage.</p>	No risks

c. *Displacement of deforestation due to mining*

Agents	Significance of the driver (see section 4.1)	Risk of displacement and related activities of the program	Significance of the risk
Miners	Low	Activity shifting and market effect: Mining activities are geographically depending on available resources, and the ER-P doesn't aim at stopping mining activities but only improve their practices and implement compensatory reforestation when necessary. There is no risk of shifting.	No risks

10.2. ER PROGRAM DESIGN FEATURES TO PREVENT AND MINIMIZE POTENTIAL

Mitigation measures for displacement risk are described in the different table in the previous section.

11. REVERSALS

11.1. IDENTIFICATION OF RISK OF REVERSALS

The assessment of natural and anthropogenic risks of reversals was conducted following the FCPF Buffer Guidelines and the four main risk factors described:

- Lack of broad and sustained stakeholder support
- Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination
- Lack of long term effectiveness in addressing underlying drivers
- Exposure and vulnerability to natural disturbances

More generally, the focus on watersheds is designed to be inclusive of populations in contiguous communities thus limiting the most immediate risk of incursions from neighboring populations. These natural geographic/geologic target groups (watersheds) provide a degree of natural impediment to large-scale population influxes, and also enable program design that is tailored to each program area, with the identified activities.

Risk Factor	Risk indicators	Default Reversal Risk Set- Aside Percentage	Discount	risk:	Resulting reversal risk set-aside percentage
Lack of broad and sustained stakeholder support	<p>As explained in section 5.1, consultations in the jurisdiction have been intensive and realized in each region of the program through the five Regional REDD+ Platforms that participated in the general design of the program, including its strategy, institutional arrangements, eligible and planned activities, FGRM and safeguards mechanism. In addition, specific consultations were carried out at local level (communes) during the different studies performed (see section 5). When looking at the number of stakeholders by taking into account the different REDD+ platforms, technical groups, and thematic workshops, around 200 hundred persons have been deeply involved into the design of the general strategy of the program to reduce deforestation, and all communes of the program have been consulted at least once.</p> <p>Also, in some area of the ER-P (Makira and CAZ), stakeholders already have a positive experience with REDD+ project and their related supporting mechanism as benefit sharing mechanism, FGRM and safeguards mechanism, and thus the ER-P was developed based on these positive experiences.</p>	10%	Low 10%	risk:	0%

Risk Factor	Risk indicators	Default Reversal Risk Set- Aside Percentage	Discount	Resulting reversal risk set-aside percentage
Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination	<p>Are there key institutions with experiences in implementing REDD+ project / programs?</p> <p>The preparation of REDD+ at national level as well as the development of the ER-P had allowed to build strong capacities to coordinate REDD+ activities. The creation, involvement and work performed by BNC REDD+, PFN REDD+ and the PFR REDD+ can illustrate that the future program will be managed by strong entities (most of element of the program described in this document have been discussed and designed with stakeholders through the platforms and with a strong support of BNC REDD+).</p> <p>However, these capacities mostly lie on the design phase of the REDD+ mechanism and of the program, but not on the real implementation of them. Currently there's a lack of institutional capacities at central and regional level to ensure that activities and project could be implemented, coordinated, and efficient.</p> <p><u>Mitigation measures:</u> This is an issue on which BNC REDD+ will focus during the next months, and some capacity building activities are already planned using the additional fund of FCPF received in 2016 (i.e. structuration of BRC REDD+ in regions and capacity building for their coordination role). It is likely that additional capacities will have to be developed or reinforced, especially within other ministries at central level, but also at sub regional level (even if an important part of capacity building will be ensured continuously with the strong support by TSS of communes, SLC, and PI (see section 6.1 and 15).</p> <p>The MEEF and BNC REDD+ are also planning to develop some partnership with other ministries in order to (i) increase their knowledge and capacities related to REDD+ (BNC REDD+ will be in charge of that), and (ii) elaborate an action plan for their involvement and role into the ER-P implementation when necessary, (iii) and identify potential external financial or technical support to ensure this role. For example, BNC REDD+ is currently discussing with USAID and USFS in order to lever potential support from them concerning</p>	10%	Medium risk: 5%	5%

the needs of capacity building for the implementation of the NFMS and FMS.

Is there a lack of cross sectoral coordination necessary for REDD+ efficiency?

The creation of the PFN and PFR REDD+ illustrates that a strong effort had been provided in order to ensure cross sectoral coordination during the development of the ER-P. The planned institutional arrangements (described in section 6.1) for the program are also reflecting that a strong cross sectoral coordination is vital for its functioning.

But currently the activities planned and described in section 4.3 are mainly coming from considerations and needs expressed by stakeholders at central, regional and local level, but they do not reflect a real commitment of concerned sectoral ministries to be responsible, even partially, for their implementation (see introduction of section 4.3).

Mitigation measures: If these different ministries are represented in the REDD+ platforms, there's a important need for developing real partnerships with MEEF and agree on specific action plan or procedures to ensure that activities of the program will be implemented in coherence and complementarity with activities of each ministries.

Risk Factor (FCPF)	Risk indicators	Default Reversal Risk Set- Aside Percentage	Discount	Resulting reversal risk set-aside percentage
Lack of long term effectiveness in addressing underlying drivers	<p><i>Is the program able to link REDD+ to economic activities and development?</i></p> <p>1/ In the context of Madagascar, the main risks of inversions within the area of the project are associated with the practice of slash and burn agriculture (“Tavy”) and uncontrolled extraction of wood energy. Both practices are largely associated with poverty of rural households in Madagascar, a situation exacerbated during periods where households are facing food emergencies. These risks are of anthropogenic origin.</p> <p><u>Mitigation measures:</u> The activities of the program are designed particularly to address these practices. To do so, activities AD1, AD2 and AI1 are dedicated to the improvement of agricultural practices and access to market in order to increase productivity and at the same time increase revenues of local population, allowing them to progressively reduce their dependency on subsistence agriculture.</p> <p>2/ The commodities driving deforestation are products from permanent crops: vanilla, clove, and coffee, high value product that are generating higher incomes to households and have a positive impact on the local economy. During the reference period, these commodities had a two-faceted impact on deforestation: on one hand, it can incentivize local populations to cut forest parcels in order to implement vanilla or clove production; on the other hand, such production is also implemented on fallow land or secondary forest, allowing their maturation and increasing carbon stocks on land with relatively low carbon content.</p> <p><u>Mitigation measure:</u> The program will implement measures to ensure that such commodities do not trigger deforestation and are systematically produced under agroforestry systems, thus participating in carbon stock enhancement when settled on fallow land or secondary forest. Most of the protected areas are already fostering such practices within their surrounding agriculture belt, with positive experiences and</p>	5%	Low risk: 5%	0%

feedbacks, and the PADAP will also implement agroforestry in 3 watersheds of the program. Activity AD2 of the ER-P is dedicated to agroforestry, and more globally, the program will try to increase sustainable production of commodities within the jurisdiction

3/ An additional risk, identified through experience, is that success in the project/program areas, if associated with important positive economic impact, can lead to influx of people that are not part of the target population thus leading to unsustainable practices in the end. This context is particularly witnessed in projects/programs of relatively short lifespan.

Mitigation measures: The ER Program design focuses on the development of activities that can be inclusive of incoming populations through identification and promotion of “no-land” activities, income-generating activities that are not dependent on land ownership, and will limit anarchic land grabs that may be associated with these practices. “No-land” activities are designed to strengthen the value chains that will reduce pressures on forest degradation directly and also indirectly through decreasing the demand for extensive land practices.

Is relevant legal and regulatory environment conducive to REDD+ objectives?

The only risk here that could lead to reversals, and as described in section 4.4, is the fact that currently there is no law, policy or regulation in Madagascar defining carbon rights.

Mitigation measure: If important progress has been done in the last months, more clarity will be provided in the next months in order to ensure that the program, through its institutional arrangements and benefit sharing mechanism, is compensating the non-existence of such legal context, and respects equity between stakeholders according to performance and results.

Risk Factor (FCPF)	Risk indicators	Default Reversal Risk Set- Aside Percentage	Discount	Resulting reversal risk set-aside percentage
<p>Exposure and vulnerability to natural disturbances</p>	<p><i>Risks due to natural forest fire.</i></p> <p>The project area is a humid rainforest habitat. No natural fires have been recorded in this ecosystem in Madagascar because it is too wet. Natural fires in Madagascar are mostly limited to savannah habitats. There is no reference or available information of natural fire resulting in large-scale deforestation in the humid forest of Madagascar. All fires are, according to literature, due to human activities in this part of the country. Post-cyclone period can enable fire propagation but the origin of the fire always seems to be anthropogenic.</p> <p><i>Risks due to pests and disease</i></p> <p>No major pest or disease outbreaks leading to die off of forest have been recorded in rainforests in Madagascar. Large scale tree pest and disease outbreaks are extremely rare in tropical natural forests due to the high diversity of tree species and low densities that are typical (Nair, 2007).</p> <p><i>Risks of extreme climate events that could contribute to deforestation.</i></p> <p>The only extreme climate events recorded on the east coast of Madagascar are cyclones. Since the beginning of the XXI century, 4 major cyclones reached the eastern coast of Madagascar and the area of the ER-P causing important damages to local population. However, very little information is available on the actual impact of cyclones on the eastern ecosystems. The majority of cyclones lose their destructive power by the time they get as far inland as the CAZ project area for example (World Bank, 2008). Even if they are powerful, the area of damage to forest is relatively limited. Native forest also recovers</p>	5%	Medium risk: 2%	3%

well following cyclone damage in the absence of anthropogenic threats and is a natural feature of the ecology of these forests (Birkinshaw, 2007). Even in an extremely powerful cyclone, less than 10% of carbon stocks of ER-P are likely to be lost and the loss will be transient with good recovery. For example, cyclone Hudah, one of the most powerful cyclones to damage forest in Madagascar in the last 15 years, was estimated to have damaged 3.2% of the 143,236 hectares of forests of the Masoala peninsula (Birkinshaw, 2007). However, Masoala is a coastal area and therefore cyclone impact at CAZ would be expected to be much less since the cyclones power reduces over land (Birkinshaw, 2007; World Bank, 2008).

The program’s overall risk rating based on the findings of previous sub-sections is showed in the table below.

Risks factors	%
Default risk	10
Lack of broad and sustained stakeholder support	0
Lack of institutional capacities and/or ineffective vertical/cross sectorial coordination	5
Lack of long term effectiveness in addressing underlying drivers	0
Exposure and vulnerability to natural disturbances	3
Overall risk rating	18

To help manage these risks, the ER Program will establish two separate buffer reserve accounts:

- a Pooled Reversal Buffer to insure against potential large-scale Reversals which exceed the amount of Buffer ERs set aside in the Reversal Buffer. Half of the default risk (5%) will be set-aside in this buffer; and
- a Reversal Buffer to insure against potential Reversals, the 13% rest will be set-aside in this buffer.

Each buffer will have separate accounts in the ER Transaction Registry (see section 18) for the exclusive purpose of receiving, disbursing, or canceling Buffer ERs that will be allocated as described before. The Reversal Buffer and the Pooled Reversal Buffer accounts will exist separately from any reversal risk management accounts established under the ER Program to manage reversal risks for ERs that are not subject to the ERPA and which, therefore, will not be transferred to the CF.

11.2. ER PROGRAM DESIGN FEATURES TO PREVENT AND MITIGATE REVERSALS

Measures to mitigate reversals risks are already described in the table of section 11.1

11.3. REVERSAL MANAGEMENT MECHANISM

Selection of reversal management mechanism:

Reversal management mechanism	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	No
Option 2: ERs from the ER Program are deposited in an ER Program -specific buffer, managed by the Carbon Fund (ER Program CF Buffer), based on a Reversal risk assessment.	Yes

11.4. MONITORING AND REPORTING OF MAJOR EMISSIONS THAT COULD LEAD TO REVERSALS OF ERS

The ER program's monitoring approach will account for deforestation. As described in section 9.2.C, the FMS will allow covering any medium and large-scale reversal due to any natural or anthropogenic hazards and extreme events. Especially, the ER program monitoring system is based on the NFMS which will include Global Forest Watch monitoring automated tools, allowing to pre-identify potential reversals.

12. UNCERTAINTIES OF THE CALCULATION OF EMISSION REDUCTIONS

This section summarizes the approach to identify, assess, minimize and quantify uncertainty following the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Chapter 3).

The methodology used to estimate average annual GHG emissions in the reference period is based on the provisions of the 2006 IPCC guidelines for national GHG inventories, which is equivalent to the Activity Data x Emission Factor (AD x EF) method indicated in Chapter 3.2.3 of the Global Forest Observation Initiative Methodological Guidance Document version 2 (GFOI MGD 2)⁸¹ as shown in section 8.

Following the identification of uncertainties and an assessment of their relevance and contribution to the overall uncertainty, uncertainties are quantified and then aggregated to a single uncertainty estimate for the RL using numerical simulation (Monte Carlo method).

12.1. IDENTIFICATION AND ASSESSMENT OF SOURCES OF UNCERTAINTY

According to Chapter 3, Volume 1 of the 2006 IPCC GL, there are eight broad classes of uncertainty: lack of completeness, Model uncertainty, Lack of data, Lack of representativeness of the data, statistical random sampling error, measurement error, misreporting or misclassification and missing data.

The identified sources applicable to this case are the following:

Sources of uncertainty and their contribution to overall uncertainty		High / Low
Activity Data		
Measurement error	<p>The measurement error could be a systematic and random error and is caused by the following:</p> <ol style="list-style-type: none"> 1. Quality and suitability of the satellite data (spatial, spectral, and temporal resolution, and geo-location). This is usually a source of systematic errors. As indicated in section 8.3, all available imagery in the reference period is used in order to have a high confidence in the classification. The geolocation error of all these sources is less than one Pixel. 2. Cartographic and thematic standards (i.e. land category definitions and MMU): As indicated in Section 8.3 there are labelling protocols that allow to reduce the systematic errors to the minimum. 3. Interpretation procedure (i.e. classification algorithm or visual interpretation). This is the largest source of error (systematic error). The existence of SOPs and QC/QA procedures (such as indicating the quality in the classification) allow to reduce this to the minimum. 4. Post-processing: There is no post-processing apart of the filtering (remove low confidence classification) and the calculations. 	L

⁸¹ GFOI (2016). Integrating 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 – Version 2. Chapter .2.3

	Hence, it is considered that this source is negligible.	
Representativeness	The sampling is spatially balanced (stratification) and random so the sample is representative of the whole population. Hence, it is considered that this source is negligible.	L
Sampling error	This would be the main source of uncertainty. Hence, it is assumed this is the only source of uncertainty.	H
Emission factor		
DBH measurement error	Systematic errors are assumed to be negligible since the inventory was carried out by experienced inventory teams with a set of standard operating procedures (SOPs) in place. Random errors may still occur but at large sample size tend to cancel each other out. Picard et al. (2015) assumed the random error of DBH measurements to contribute 2% to the uncertainty of emission factors. This error is considered in the quantification.	H
H measurement error	Random errors related to height measurements are likely to be higher, in particular in dense tropical forests where it is difficult to see the tree top, in particular from a sufficiently long distance (equal or bigger than the tree height). Chave et al. (2004) measured the height of approx. 1,000 trees and found the measured value to be within +/- 10% of the actual value. This error is considered in the quantification.	H
Plot delineation	Random errors related to setting up the plot boundary and using the relascope may also occur. Specifically, in case of the latter, it can be difficult to determine whether so-called 'threshold' trees are inside or outside the plot radius. Here, both the 2014 and 2016 forest inventories relied on a method that is widely used in commercial timber cruising, which attributes these so-called threshold trees a value of 0.5. Given the large sample size it is likely that inclusion and exclusion errors cancel each other out over the entire inventory dataset. Hence, it is considered that this source is negligible.	L
Wood density measurement error	The basic wood density or Wood Specific Gravity (WGS) cannot be easily measured during forest inventories, and it is usually sourced from peer-reviewed publications and global databases. Chave et al. (2004) assumed that the error of this predictor was +/- 10% of the actual values. WSG values used in the RL have been sourced from different publications. Research in Madagascar by Ramanantoandro et al. (2015) has shown that WSG values from literature overestimate measured WSG by 16% on average. However, effects on biomass estimates were found to be not significant at the 95% confidence level. This error is considered in the quantification.	H
Root-to-shoot ratio measurement	This error is considered in the quantification as it is high.	H
Biomass allometric equation	The allometric model error can be divided in the following sources. a. the error due to the uncertainty of the model's coefficients; b. the error linked to the residual model error;	H

(Model error)	<p>c. the selection of the allometric model.</p> <p>According to Picard et al. (2015)⁸² the largest uncertainty is due to the selection of the allometric model which may be 77% of the mean biomass estimate. Van Breugel et al. (2011)⁸³ estimated that the errors linked to the allometric equation could vary from 5 and 35% depending on the model selected. The third error is assumed to be negligible for the woody biomass species as these equations are calibrated with trees measured within the same ecoregion or even the ER program area.</p> <p>The other two errors are usually negligible but they will be considered in the quantification.</p>	
Height-DBH equation (Model error)	This is a locally calibrated model. Only the residual model error will be considered as this linked to the measurement uncertainty.	H
Sampling error	This error is one of the main sources of errors. This will be considered in the quantification of uncertainty.	H
Representativeness error	<p>The lack of representativeness usually causes bias, i.e. if the sample is not representative of the population. In the current case, the source of this error is the following:</p> <ul style="list-style-type: none"> • Root to shoot ratio: This is sourced from the IPCC and might not be representative. This source is not considered as bias, but a random error of the root-shoot ratio is considered. • Representativeness of the samples: In the case of MNF this could be a source of uncertainty as the estimate is based on samples from different forest types. However, the MNF biomass stocks estimate is conservative (samples in degraded forest or single layer were not considered) in terms of reducing emissions and ERs, so it is assumed that this source of error is negligible. 	H
Calculations		
Model error	<p>Although the simple multiplication of AD and EF does not contain any error, there are some assumptions such as assuming that after deforestation there is an instantaneous transfer of AGB and BGB to the atmosphere or that the biomass in non-forest grows immediately after conversion. The former assumption is based on best practices, while the latter is conservative in terms of GHG emissions and emission reductions.</p> <p>Another potential source is that it is assumed that the carbon stocks of deforested forests is equal to the average of all forests, whether they are primary or not. This last assumption is partially corrected in the RL by separating the stratum of primary forest and the stratum of modified natural forest (with higher deforestation and lower biomass stocks).</p>	H

⁸² Picard et al. (2015) Error in the estimation of emission factors for forest degradation in central Africa. J For Res DOI 10.1007/s10310-015-0510-5

⁸³ Van Breugel et al. (2011) Estimating carbon stock in secondary forests: Decisions and uncertainties associated with allometric biomass models. Forest Ecology and Management 262 (2011) 1648–1657

	Another error might be the ages assumed in order to estimate the transition from non-forest to modified natural forest. This error has been taken into consideration.	
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All high errors are assumed to have a large contribution and have been quantified below.

12.2. QUANTIFICATION OF UNCERTAINTY IN REFERENCE LEVEL SETTING

d. *Uncertainty of Activity Data*

Details of the estimation of the uncertainty of activity data is provided in Section 8.3. The uncertainty of activity data is shown in the following table.

	Deforestation				Enhancement		Degradation	
	Primary forest	Disturbed forest	Secondary forest	Agroforestry	Secondary forest	Agroforestry	Primary forest to modified natural forest	Primary forest to plantation
90% confidence – Relative margin of error	68%	19%	43%	123%	66%	73%	28%	0

A Monte Carlo simulation cannot be used in order to estimate uncertainty of activity data, even though this is large according to the IPCC.

e. *Uncertainty of Emission Factors*

In order to fulfill the requirement of the MF with regard to estimating the uncertainty of emissions reductions, since the uncertainty of emission factors are generally high, the ER-Program also uses numerical simulation (Monte Carlo) to estimate the uncertainty of the EFs.

The application of the Monte Carlo simulation follows the guidance provided in the 2006 IPCC guidelines. The summary of the different steps is provided:

- a. Draw 1000 realizations of the different measured independent variables (i.e. DBH, H, and WSG) assuming a symmetrical normal distribution. It is assumed that the DBH measurement has an error of 2%, the H has an error of 5% and the WSG has an error of 10%.
- b. Draw 1000 realization of the vector of the parameters of the Vieilledent allometric model assuming a multi-normal distribution of the parameters. This was not done for the other allometric equations due to the lack of data to estimate the covariance matrices.
- c. Draw 1000 realization of the random error of the H-DBH equation assuming a normal distribution with value 0 and standard deviation the standard error of the equation. This was not done for the H-DBH functions of the 2016 inventory.
- d. Estimate the resulting estimate and standard error and draw a realization from a normal distribution with that estimate and standard error. Do this with each of the 1000 realizations.

- e. Using the 10,000 combined realizations, the 90% percentile (p_{95}) and 10% percentile (p_5) will be estimated using the following equation: $U_{Lower} = \frac{p_5 - \bar{x}}{\bar{x}} 100$; $U_{Upper} = \frac{p_{95} - \bar{x}}{\bar{x}} 100$.

The uncertainty estimate of the **aboveground biomass stocks** are provided in the following table:

Forest type	Median (tdm/ha)	LC Sup.	IC inf.	HWCI 90%
Primary forest	251.2	264.3	240.9	5%
Disturbed forest	180.0	196.8	162.6	9%
Secondary forest	87.0	99.3	79.0	12%
Agroforestry	91.7	104.1	80.5	13%
Non forest	12.0	17.0	7.7	39%

These values are very close to the sampling errors presented in Chapter 8.3 so it is considered that this is the main source of error. Not considering this source of error, the results would be as follows:

Classe	Median (tdm/ha)	LC Sup.	IC inf.	HWCI 90%
Primary forest	251.1	256.1	243.1	3%
Disturbed forest	177.9	182.2	171.9	3%
Secondary forest	87.1	88.2	85.8	1%
Agroforestry	91.2	95.2	87.1	4%

Hence, the other sources of errors such as measurement error and modelling error may be neglected.

f. *Uncertainty of the Reference Level*

Following the requirements of the MF, a Monte Carlo simulation was done in this case. Below the table with all parameters considered and with the assumed probability distribution functions.

Source ou puit	Parameter	Unit	Estimate	SE	Lo we r	Up per	Probability distributio n function
Deforestation - primary forest	Annual deforestation	ha/year	1,738.4	713.2			Normal, above zero
Deforestation - disturbed forest	Annual deforestation	ha/year	29,272.6	3,466.9			Normal, above zero
Deforestation - secondary forest	Annual deforestation	ha/year	8,147.5	2,147.5			Normal, above zero
Deforestation - agroforestry	Annual deforestation	ha/year	300.4	224.0			Normal, above zero
Forest gain - secondary forest	Annual forest regrowth	ha/year	3,522.3	1,412.			Normal, above

Source ou puit	Parameter	Unit	Estimate	SE	Lo we r	Up per	Probability distributio n function
				5			zero
Forest gain - agroforestry	Annual forest regrowth	ha/year	2,479.6	1,105.6			Normal, above zero
Degradation	Annual degradation	ha/year	10,943.6	1,859.2			Normal, above zero
Deforestation - primary forest	AGB primary forest	tdm/ha	251.0	6.0			Normal
Deforestation and degradation - disturbed forest	AGB modified natural forest	tdm/ha	171.0	9.9			Normal
Deforestation - secondary forest	AGB modified natural forest	tdm/ha	85.7	5.2			Normal
Deforestation - agroforestry	AGB modified natural forest	tdm/ha	87.9	7.6			Normal
Non-Forest	AGB non-forest	tdm/ha	12.0	3.3			Normal
Deforestation	RSR >125 tdm/ha	dimensionless	0.2		0.2	0.3	Uniform
	RSR <125 tdm/ha	dimensionless	0.2		0.1	0.3	Uniform
Deforestation	SOCref	tC/ha	47.0	21.2			Normal
	FLU	dimensionless	0.8	0.1			Normal
	FMG	dimensionless	1.2	0.1			Normal
	FI	dimensionless	0.9	0.1			Normal
	D	dimensionless	1.0				
Deforestation - primary forest	Dead wood content	tdm/ha	12.4	0.9			Normal
Deforestation - disturbed forest	Dead wood content	tdm/ha	9.9	1.3			Normal
Deforestation - secondary forest	Dead wood content	tdm/ha	5.0	0.7			Normal
Deforestation - agroforestry	Dead wood content	tdm/ha	5.1	0.7			Normal
Deforestation	Litter content	tC/ha	2.1		1.0	3.0	Uniform
Non-CO2 emissions	"Combustion factor - Primary tropical forest	dimensionless	0.3	0.1			Normal

Source ou puit	Parameter	Unit	Estimate	SE	Lo we r	Up per	Probability distributio n function
Non-CO2 emissions	(slash and burn)"	dimensionl ess	0.5	0.1			Normal
Non-CO2 emissions	"Secondary tropical forest	g/kg	6.8	2.0			Normal
Non-CO2 emissions	(slash and burn)"	g/kg	0.2	0.1			Normal, above zero
Forest gain	Emission factor CH4 Tropical forest	Years	20.0		12. 0	18. 0	Uniform
Forest gain	Emission factor N2OTropical forest	Years	5.0	-	3.0	7.0	Uniform
Other data	Age modified natural forest	Fraction carbone, Tropical et soustropical ; tous	0.5		0.4	0.5	Uniform
	Age non forest	Facteur de conversion vers CO2	3.7				
	CF	Ans	10.0				
		CH4	21.0				
	Periode de référence	N2O	298.0				Normal, above zero

In this case 10000 realizations of each parameter was made and the model was constructed in order to ensure correlation between parameters (e.g. non-forest value is the same to set the EF for primary forest and MNF forest.

The results are provided in the following table and it results in an uncertainty of 25% at 90% confidence, which is equivalent to an uncertainty discount factor of 4%.

Parameter	REL
Mean	15,461,928
STD	2,376,641
Upper bound 90% CI	19,548,927
Lower bound 90% CI	11,831,431
HWCI	3,858,748
Relative margin	25%
Uncertainty discount	4%

Doing some sensitivity analysis with the sources the following sources were identified as the most important:

- Assuming that the activity data does not have uncertainty, the overall uncertainty would be equal to 19%.
- Assuming that the IPCC default factors such as those used to estimate GHG emissions from SOC and Litter, the overall uncertainty would be reduced to 18%
- As indicated previously, the uncertainty of the emission factors would not have any impact, as assuming no uncertainty in the aboveground biomass and dead wood biomass, the uncertainty would still be 25%

13. CALCULATION OF EMISSION REDUCTIONS

13.1. EX-ANTE ESTIMATION OF THE EMISSION REDUCTIONS

The Madagascar ER-P Area will focus on emission reductions from three eligible REDD+ activities, which will vary depending on various projects implemented (different funding streams) and future decisions on where to reinvest within the ER-P in order to generate additional ER. The three main ER activities at this stage within the ER-P where project activities are implemented or about to be implemented are:

- Avoided deforestation or reducing emissions from deforestation, which is sourced from:
 - All funding streams zones;
- Avoided degradation or reducing emissions from degradation, which is sourced from:
 - All funding streams zones;
- Natural growth (also called carbon stocks enhancements), which is sourced from part of the:
 - PADAP funding stream zone;
 - CASEF funding stream zone;

In terms of avoided deforestation, the following targets are indicated:

- 30% reduction over 80% of the land within protected area (MNP);
- 29% reduction over 100% of the land within REDD+ pilot project;
- 80% reduction over 80% of the land within MBG funding stream zones (small areas – controllable);
- 15% reduction over 3.1% of the PADAP funding stream zones;
- 100% reduction over 14% of the CASEF funding stream zones (very small area – highly controllable);

In terms of avoided degradation, all estimates are using a percentage of reduction as per deforestation target.

In terms of the natural growth (carbon stock enhancements), the following surface targets are indicated for such activities:

- 23% of the landscape conformation land use classes 3 and 4, which represents 3.1% of the PADAP funding stream zones;
- 14% of the CASEF funding stream zones.

The summary of the ER potential per eligible activity and per funding stream are presented in Table 30 per funding stream / zone.

Table 30:: Ex Ante evaluation of the Emission reductions opportunities and potential in the MERPA

Years	Emissions data from REL				Emission Reduction				Buffer		Total ER potential
	Emissions from deforestation (tCO2/yr) - REL	Emissions from degradation (tCO2/yr) - REL	Removals from enhancement of carbon stocks (tCO2/yr) - REL	Total Reference Level (tCO2/yr)	Total T CO2 Eq per annum ER from avoided deforestation	Total T CO2 Eq per annum ER from avoided degradation	Total T CO2 Eq per annum ER from Carbon stock enhancement	Total T CO2 Eq per annum ER	Uncertainty buffer (%)	Reversals buffer (%)	
	4%	18%	Reserve for uncertainty	Reserve for reversals							
2018	14 003 917	1 872 050	-61 739	15 814 229	2 233 147	42 178	110 262	2 385 587	95 423	17 176	2 272 987
2019	14 003 917	1 872 050	-134 389	15 741 578	2 268 761	42 850	220 481	2 532 092	101 284	18 231	2 412 577
2020	14 003 917	1 872 050	-207 040	15 668 928	2 576 131	48 656	367 453	2 992 240	119 690	21 544	2 851 006
2021	14 003 917	1 872 050	-279 690	15 596 277	2 621 155	49 506	587 803	3 258 464	130 339	23 461	3 104 664
2022	14 003 917	1 872 050	-352 341	15 523 627	2 666 179	50 356	734 644	3 451 180	138 047	24 848	3 288 284
Total	70 019 585	9 360 252	-1 035 199	78 344 638	12 365 373	233 546	2 020 643	14 619 562	584 782	105 261	13 929 519

While the avoided deforestation potential appears high, it must be stated that nearly all the potential for avoided deforestation activities is exploited within the ER-P, whereas the natural growth potential is only minimally exploited as a source of ER. The current activity program planned suggests that natural growth and regeneration opportunities will be implemented on approximately 37,336 ha, whereas there is an “easy potential” for 81,725 to be placed under such ER generating land use (thereby approximately 55% of the easy potential remains untapped). It is also possible to use ca 460,000 ha in a reasonably easy manner (from a total area of 544,833 ha with this potential – thereby approximately 85% of the potential for natural regeneration and growth remains untapped) to further develop the natural regeneration and natural growth potential either from natural degraded forests or through reforestation if a land use management plan and zoning plan is implemented correctly, as planned through the PADAP funding stream. If one considers that at this stage only circa 6.9% of the potential area will be used to account for natural regeneration and will produce circa 2.02 M T CO₂ eq over 5 years, should the full area be used, approximately 14 times this amount of ER (circa 28 M T CO₂ eq over 5 years) could be generated through careful land use planning, in addition to avoided deforestation. The ER-P has a large potential for further gains in terms of durable ER generation.

14. SAFEGUARDS

14.1. DESCRIPTION OF HOW THE ER PROGRAM MEETS THE WORLD BANK SOCIAL AND ENVIRONMENTAL SAFEGUARDS AND PROMOTES AND SUPPORTS THE SAFEGUARDS INCLUDED IN UNFCCC GUIDANCE RELATED TO REDD+

a. *Impacts / risks assessment of REDD+ activities*

The **Strategic Environmental and Social Assessment (SESA)** for REDD+ in Madagascar was conducted in a participatory manner with all stakeholders, including civil society, taking an active part. The assessment was conducted as a staggered process throughout 2016 and 2017 in conjunction with the development of the National REDD+ Strategy and the ER-P. Three series of extensive consultations (at local and regional level) were conducted, in order to identify all REDD+ stakeholders, to prioritize REDD+ environmental and social issues, to refine strategic orientations and activities of the National REDD+ Strategy, and finally to evaluate their respective environmental and social impacts and related safeguards measures. Environmental and social risks have been identified and recommendations have been made and taken into account in the design of the National REDD+ Strategy.

The methodology for the SESA included three phases, summarized below.

Phase 1: Preparation of the SESA

1. Stakeholder synthesis and analysis highlighted the limited influence of local people in decision-making process was highlighted, while at the same time being some of the most impacted by REDD+ activities. In response, a specific consultation plan was designed to address this concern and resulted in 63 percent of people surveyed coming from local level, with a significant proportion of women participants (32 percent);
2. Identification of environmental and social issues related to REDD+;
3. Analysis of the major issues related to the REDD+ through the a national SESA launch workshop that was attended by 64 people, including 36% of women, representing the public sector, civil society, technical and financial partners, research centers and universities, and economic operators.

Phase 2: Consultation and improvement of REDD+ policy options

- Surveys and consultations at the village and commune levels included a total of 847 people who were surveyed and interviewed;
- Analysis and prioritization of social and environmental issues related to deforestation and forest degradation (DD) factors resulting from surveys and consultations:
 - 2 environmental issues: uncertainty surrounding current (legal) state of non-protected areas and rights to access forest resources;

- 3 economic and social issues: low level of knowledge of local population, concerns about preserving tradition and heritage (related to unsustainable practices) and unbalanced share of costs and benefits of REDD+;
 - 2 governance issues: lack of efficiency in protected areas management and lack of stakeholders participation in forest management.
- Elaboration of a logic Tree related to the problems related to DD leading to appropriate and relevant strategic orientations for addressing the problems;
 - Evaluation of strategic orientations in relation to the findings from the analysis of consultations and surveys;
 - Improvement of strategic orientations for REDD+, taking into account the root causes of DD and sustainable development principles.

Phase 3: Assessment of the impacts of REDD+ activities

Impact analysis of REDD+ strategic orientations and activities through regional workshops (526 participants in total) were organized to develop measures aimed to: (i) reinforce REDD+ successes; (ii) translate potentialities into actions; (iii) draw lessons from failures and; (iv) overcome obstacles that will contribute to mitigating risks. Different workshops were also held with the Working Group on Safeguards (GTS) during the development of the ER-P. The contributions from the GTS identified, per activities, the potential environmental and social risks that REDD+ activities could generate in order to identify the related mitigation actions for each activity. When identifying these risks, particular attention has been paid to potential gender differentiated impacts.

On the basis of the impact analyses, mitigation actions were developed, discussed, and refined by taking into account corresponding Operational Policies (OP) of the World Bank, national interpretation of Cancun Safeguards and UN-REDD⁸⁴, REDD+ Social and Environmental Standards⁸⁵, and all national policies linked to safeguards (see ANNEX VII). This has led to the formulation of a national REDD+ safeguards frameworks.

⁸⁴ Working Group on Safeguards (GTS) and the BNC REDD+ have defined a set of Principles, Criteria and Indicators (PCI-REDD+) applicable in the context of Madagascar that sets a high level of social and environmental performance for the REDD+ strategy.

⁸⁵ REDD+ SES (2012). *Social and Environmental Standards REDD+*, 10 September 2012, 30 pages.

	Activities of the program	Related environmental and social risks / impacts	Safeguards measures
Agricultural sector	AD 1 - Optimize production systems and agricultural and livestock-dedicated infrastructure	Loss of habitats and reduction of biodiversity due to conversion of forest and other natural ecosystems into land for cultivation and livestock	<ul style="list-style-type: none"> • Participatory mapping work/ local land-use plan in order to identify agricultural development zones at the scale of landscapes • Support for local organization so they can control extension of cultivated area and agriculture intensification without harm environment • Awareness raising among crop farmers to adhere to the ER Program performance ambition;
		<p>Overuse or bad management of fertilizer and pesticide products conducting to water and soil contamination</p> <p>Human in toxification due to the use of pesticide</p> <p>Creation of dependency on farm inputs</p> <p>Introduction of GMO seeds</p>	<ul style="list-style-type: none"> • Elaborate a pesticide and pest framework • Reinforce control and capacitation on farm inputs • Valorize local farm inputs for agricultural intensification
		Over-stocking of livestock: risk of contamination of soil and water by animal excreta	<ul style="list-style-type: none"> • Reinforce technical supervision of stock farmers • Valorization of animal excreta as agricultural fertilizer
		Social conflicts due to new land-use plan	<ul style="list-style-type: none"> • Reinforce land tenure security • Support implementation of land use plans
		Social conflicts due to ownership and management of agricultural infrastructures	<ul style="list-style-type: none"> • Agricultural support given to rural households through targeted structures • Implement a transparent benefit sharing mechanism • Promote the role of associative movement and women groups into agriculture planning and activities • Reinforce the role of local actors and of women in the decision-making process at local level

	Increased agricultural production from households that increases child, women, and indigenous people labor (and labor with inadequate worker protection).	<ul style="list-style-type: none"> Promote agriculture equipment in order to reduce field work time
	Loss of habitats and reduction of biodiversity due to conversion of forest into agroforestry systems, or due to displacement of annual crops resulting from land appropriation for agroforestry	<ul style="list-style-type: none"> Elaborate a specific Process framework Protect and sustainably manage watersheds Implement land-use plans Reinforce capacity of institutions / management structures out of REDD+ sites of interventions
AD 2 - Improve agroforestry systems to enhance cash crop production and food security of local communities	Introduction of invasive species	<ul style="list-style-type: none"> Reinforce control and capacity of farm inputs Enhance value of local farm inputs
	Overuse and bad management of fertilizer and pesticide products with related risks of water and soil contamination. Human intoxication due to the use of pesticide	
	Agroforestry systems and production do not correspond to local economic and food security interests, making some local people more vulnerable.	<ul style="list-style-type: none"> Reinforce technical supervision of farmers Reinforce REDD+ monitoring systems to ensure that activities are reducing dependency of local people on forest natural resources Support of processing and conservation of agricultural products at the household level to reduce workload Support for collective discussion of gender issues in agricultural production.
	Increased agricultural production from households that increases child, women, and indigenous people labor (and labor with inadequate worker protection).	
	Foster medium- and large-scale farmers and exclude small-scale farmers from development.	

	AI 1 - Support the development and setting up of small and medium-sized enterprises and/or rural cooperatives and promote the creation of REDD+ mechanism-related subsectors at the local level	Social conflict due to changes in land-use	<ul style="list-style-type: none"> • Reinforce land tenure security and facilitate agroforestry land • Support implementation of land use plans
		Increase the influx of external population that could lead to a non-respect of cultural and traditional heritage and increasing vulnerability of native population.	<ul style="list-style-type: none"> • Reinforce implementation of land-use plan • Reinforce structures in charge of the management of immigration
		<p>Restriction of access to natural resources important for livelihoods</p> <p>Negative economic impacts on other sectors or supply-chain</p> <p>Without appropriate alternatives for current practices, there could be an increase in illegal use of forest resources, in exploitation of natural resources in areas adjacent to protected natural forests, and in conversion of degraded / secondary forests</p> <p>Increase poverty of local population highly dependent on forest resources</p>	<ul style="list-style-type: none"> • Develop and implement an efficient grievance mechanism adopted by all stakeholders • Develop alternatives of natural resources use by promoting afforestation and agriculture intensification • Support the development of deforestation-free value-chain • Reinforce local control structures
Forest sector	FD 1 - Improve the management of forest areas under the landscape approach	Social conflict due to changes in land-use	<ul style="list-style-type: none"> • Reinforce land tenure security and facilitate agroforestry land • Support implementation of land use plans
		Loss of habitats and reduction of biodiversity due to propagation of invasive species	<ul style="list-style-type: none"> • Restrict afforestation of species that have not been proven to be adapted to local environment • Promote afforestation of native and local species
	FD 2 - Promote private and community reforestation,	Degradation of natural habitats due to parasites and other pathogenic agents due to the simplification of initial ecosystems.	<ul style="list-style-type: none"> • Avoid monospecific afforestation next to natural forests

rehabilitate degraded forest areas, and reforest in consideration of local needs, without converting natural forests	Drop in soil humidity due to plantation of fast growth tree species	<ul style="list-style-type: none"> Promote afforestation with species improving quality of soil (Fabaceae)
	Soil erosion due to logging	<ul style="list-style-type: none"> Control the application of specifications and management plan of logging
	Increase of sedimentation in water course	<ul style="list-style-type: none"> Protect and sustainably manage watersheds
	Restriction of access to natural resources important for livelihoods	<ul style="list-style-type: none"> Develop and implement an efficient grievance mechanism adopted by all stakeholders Develop alternatives of natural resources use by promoting afforestation and agriculture intensification
FI 1 - Reinforce the forest surveillance and monitoring system and regulatory text enforcement, including fire management	Social conflicts due to contradiction between customary rights and statutory laws when no alternatives to illegal use of resources are provided to local people	<ul style="list-style-type: none"> Develop and implement an efficient grievance mechanism adopted by all stakeholders Develop alternatives of natural resources use by promoting afforestation and agriculture intensification
	Transformation of non-wood products could lead to an increase in use of wood fuel. Social conflicts over valuable sources of non-wood products. Uncontrolled fire from honey collection	<ul style="list-style-type: none"> Control and manage exploitation of NTFP and promote techniques for improvement and intensification of NTFP production Reinforce capacity of farmers to avoid uncontrolled fire from honey collection
FI 2 -Improve the contribution of the forest sector to economic development by promoting the use of non-wood products and other subsectors that do not affect the carbon stock	Create incentives to continue the use of fuel wood and charcoal leading to increased production (in response to demographic growth) and degradation and deforestation in the long term	<ul style="list-style-type: none"> Support and promote sustainable energy sources as alternatives of fuelwood.

	ED 1 - Promote improved fuel wood transformation and use techniques, as well as the dissemination of improved charcoal stoves in urban centers	Micro or medium-scale hydropower production: (i) during the construction phase: risks of pollution and compacting the soils, influx of potential migration population (quite small for micro and medium systems), (ii) during the operational phase: negative impacts on local fauna and flora, perturbation of local use and economy related to water courses.	<ul style="list-style-type: none"> • Elaborate and respect environmental and social management plan when micro or medium-scale hydropower site are implemented
	ED 2 - Develop the use of renewable energy (solar, biogas, etc.) for domestic use	-	
	EI 1 - Support the harmonization and development of the legal framework relating to the development of alternatives to fuel wood and sustainable fuel wood supply	-	
Crosscutting and other sectors	ID 1 - Enhance the benefits delivered by the conservation of biodiversity and ecosystem services	<p>Social conflicts due to changes in land-use: local elites or tenure speculators that have important financial resources or specific on local decision makers can influence land-use planning to get further unfair access to land.</p> <p>Restriction of access to natural resources important for livelihoods</p>	<ul style="list-style-type: none"> • Reinforce implementation of land-use plan • Reinforce participation of vulnerable people, women and young in all REDD+ activity planning and implementation process. • Ensure FPIC principles during REDD+ activities implementation

<p>II 1 - Reinforce land security, including with reforestation actors</p>	<p>All risks related to reforestation (see above)</p>	<ul style="list-style-type: none"> • All measures related to reforestation (see above)
<p>II 2 - Improve the coordination and monitoring of mining and agricultural developments and ensure the setting up of compensatory reforestation</p>	<p>Institutional and decentralized arrangements could compromise the financial efficiency of the program, and thus, the availability of final revenues and benefits for local population.</p> <p>Potential exclusion of vulnerable people distant from local elites, decision makers or traditional authorities.</p>	<ul style="list-style-type: none"> • Establish a fair and transparent benefit sharing mechanism • Support targeted actors of REDD+ activities into planning process.
<p>II 3 - Reinforce decentralized management and coordination of REDD+ mechanism-related interventions at local level</p>	<p>Restriction of access to natural resources important for livelihoods</p>	<ul style="list-style-type: none"> • Reinforce participation of vulnerable people, women and young in all REDD+ activity planning and implementation process. • Ensure FPIC principles during REDD+ activities implementation
<p>II 4 - Align the legal and institutional frameworks to ensure good governance of the REDD+ mechanism</p>	<p>-</p>	<p>-</p>

b. *National framework for safeguards*

Through the development of the SESA recommendations and safeguards actions for the strategic orientations of the National REDD+ Strategy were identified and operational tools for the implementation of REDD+ projects and activities were produced. The safeguards instruments produced include: **An Environmental and Social Management Framework (ESMF), a Population Resettlement Policy Framework (PRPF) and a Process Framework (PF)**. It should be noted that under PADAP, a pest and pesticide management framework was developed and will be implemented within the ER-P, and that the ESMF for the ER-P's will also include elements on the management of pests and pesticides, consistent with the framework developed for PADAP.

These three frameworks are being finalized and should be submitted to the World Bank for review and clearance in October 2017:

- The ESMF ensures assessment and mitigation of potential negative environmental and social impacts and to optimize positive impacts, including those for carbon and non-carbon benefits;
- The PRPF defines the criteria and procedures to be followed in the event the implementation of a REDD+ activity entails risks of negative social impacts in terms of land rights, property or livelihoods due to the involuntary resettlement of people or restricting access to resources;
- The PF describes the participatory process through which members of communities potentially affected by restriction on access to natural resources take part, inter alia, in the definition of eligibility criteria for affected persons, measures to assist affected populations, and efforts to improve or rebuild their livelihoods, and finally in the grievance redress mechanism.

Several national legal texts are supporting safeguards in Madagascar in line with UNFCCC principles (See Annex VII for more detail). However, these three REDD+ framework will be endorsed by the government once they have been validated through a national process and they are cleared by the World Bank, anticipated by the end of 2017. Information sessions on the content of these framework will be organized in the coming weeks at regional level with all stakeholders in order to receive any further specifications that are raised in order to support a greater appreciation and appropriation of these frameworks by stakeholders. Specific capacity building workshops with the Civil Society Organizations and women's associations will also be organized in parallel so that they will be able to raise specific concerns, and/or how the measures apply to them and to enable an effective application of safeguards measures for REDD+ projects.

Additionally, the Working Group on Safeguards (GTS) have defined a set of Principles, Criteria and Indicators (PCI-REDD+) applicable in the context of Madagascar that sets a high level of social and environmental performance for the REDD+ strategy in accordance with the Cancun Safeguards, the UN-REDD Principles and the REDD+ SES principle-criteria.⁸⁶ The Safeguards Information System (SIS) that is being set up to monitor the implementation of Madagascar's REDD+ strategy and the projects of the ER-P

⁸⁶ REDD+ SES (2012). *Social and Environmental Standards REDD+*, 10 September 2012, 30 pages.

will be based on these PCI-REDD+ (see Annex IV for more details, and also on the specific [website](#) under construction for a better overview). The corresponding 7 principles, criteria and indicators address the issues of participation, governance and transparency, but also the increase and sharing of social and economic benefits, gender mainstreaming, respect for and promotion of rights and remedies. Madagascar will work in the coming months to (i) strengthen the capacities of ER-P stakeholders, including civil society (CSOs) to monitor safeguards, and (ii) test these indicators in the field.

The intervention strategy for this ER-P was developed concurrently with the definition of the National REDD+ Strategy and as such has fully taken into account the recommendations and analyses that were part of the SESA and the resulting frameworks. As a pilot experiment in the application of national REDD+ instruments, the program will provide an opportunity to outline how safeguards are being met in the various phases of implementation, using PCI-REDD+ and in line with UNFCCC principles.

The management of the program's social and environmental safeguards is fully integrated into the process of identification, design and monitoring and evaluation of the ER-P's REDD+ projects and activities. Any REDD+ project financed by the program must therefore comply with the above-mentioned requirements applicable to them at each stage of their implementation.

c. Categorization and monitoring of REDD+ safeguards

Environmental and Social Management Framework (ESMF)

When a project is identified, the following mechanism is used to determine whether a particular REDD+ activity will be subject to an Environmental Impact Assessment (EIA), an Environmental Commitment Program (PREE), or another authorization (to be issued by line ministries or local authorities).

v. National classification

Three categories are defined in the classification of projects by the Malagasy environmental legislation:

- **Category 1: Projects subject to an Environmental Impact Assessment (EIA):** Projects subject to an EIA are projects that are likely to have harmful effects on the environment due to their technical nature, contiguity, their large dimensions or the sensitivity of the environment where they are established. A list of projects requiring an EIA is provided in Annex I of the MECIE Decree. EIAs must contain a Project Environmental Management Plan (PEMP, also known as EMP or ESMP).
- **Category 2: Projects subject to an Environmental Commitment Program (PREE):** Projects listed in Annex II of the MECIE Decree are subject to the PREE. These are projects whose nature, scope and other related characteristics have the potential to cause some environmental impacts, though such impacts are not large enough to require an independent scientific EIA.
- **Category 3: Projects that require no study** because they have no impact on the environment or but will have to be categorized by ONE to justify this classification.

vi. World Bank's classification

The World Bank refers to three categories of projects in its classification:

- **Category A:** A project with major environmental and social risks that requires the preparation of an in-depth Environmental and Social Impact Assessment (ESIA).
- **Category B:** Project with moderate environmental and social risk that requires the preparation of an Environmental and Social Management Plan (ESMP)
- **Category C:** Project without significant environmental or social impacts that requires simple environmental mitigation measures.

vii. Environmental and social selection steps

In general, the environmental and social screening process is comprised of the following stages:

Step 1: Identification of activities to implement and preparation of sub-projects

Based on proposals from validated REDD+ activity plans, the planned projects will be identified by the BNCR and BRCs REDD+ (see section 6).

Step 2: Selection and environmental and social classification of sub-projects

During the preparation of the technical implementation documents, agents of the BNC REDD+ and the BRC REDD+ will complete the environmental and social screening form and will proceed to pre-select activities, to determine whether an environmental and/or social assessment is required in compliance with the MECIE Decree. In addition to potential environmental and social impacts, the selection outcomes will also indicate: (i) the need for land acquisition; and (ii) restrictions on access to natural resources and the type of public consultations that were conducted during the selection process.

Ideally, pre-selection is done in the field, in consultation with the communities and the relevant decentralized and deconcentrated technical services.

Step 3: Validation of selection and categorization of projects

The screening completed during the previous step is sent to the REDD+ Program's Environmental and Social Officer (within the BNC REDD+) in order to be validated with the project promoter. Further to verification, the BNC REDD+ sends the form for approval to the National Office for the Environment (ONE), the only entity officially authorized by the decree MECIE to carry out the screening. At ONE, a Screening Committee has been set up to decide on the type of environmental and social assessment to be carried out (categorization). In order to deal with the technical aspects and feasibility of the project submitted to categorization, the committee may call upon a resource person from the BNC REDD+, as needed.

Once the categorization is done, ONE issues a notification letter.

It should be noted that REDD+ has been categorized as "B" by the World Bank as it only includes activities that may have moderate environmental and social impacts. In addition, REDD+ comprises social aspects that are fairly sensitive, especially if access to resources is limited by closures, prohibition of certain

customary rights of use, etc. In this respect, the outcomes of the selection must in the vast majority of cases result in a **World Bank Environmental Category B or C**. Sub-projects under Category A will not be funded by the program.

Any activity classified as Category 1 by ONE (Annex 1 of the MECIE decree) requires the preparation of an EIA as well as of an ESMP. An activity classified as Category 2 by ONE will require the preparation of an Environmental Commitment Program (PREE).

Normally, REDD+ program **activities classified in the World Bank's Category B will** require an environmental review which will result either in the application of simple mitigation measures or the preparation of a project-specific ESMP or ESPP. In the case of an activity or sub-project classified in Category B by the Bank but classified in Category 1 by ONE, the preparation of an EIA is required.

World Bank's category C indicates that potential environmental and social impacts are considered to be of little significance and do not require specific environmental assessments, but only the application of simple environmental measures or mitigation measures.

Further to this process where the activity's appropriate environmental category would have been identified, and therefore the scope magnitude of the environmental assessment required, the BNC REDD+'s Environmental and Social Officer (ESO) will make a recommendation as to whether (a) an environmental assessment is not necessary or (b) simple mitigation measures are required and a separate ESMP or PREE should be carried out, or (c) an Environmental Impact Assessment (EIA) should be carried out with the development of a ESMP.

Step 4: Implementation of an environmental and social assessment

a. When an EIA is required (ONE's Category 1), BNC REDD+ will carry out the following activities:

- Preparation of terms of reference for the EIA;
- Recruitment of qualified consultants to conduct the EIA in accordance with the terms of reference;
- Public consultations in accordance with the terms of reference;
- Submission of the EIE to ONE for review and issuance of the environmental permit;
- Submission of the EIA report to the World Bank for non-objection.

According to the MECIE decree, a general directive specifies the content of an EIA, including the following as a minimum:

- A document certifying the legal status of the place where the project is located;
- A description of the investment project;
- A review of the environmental and social system affected or potentially affected by the project; the analysis should lead to a schematic model highlighting the main aspects (static or dynamic, local or regional) of the environmental and social system, in particular those likely to be affected by the proposed investment;
- A prospective review of the planned interventions' possible effects on the previously described system;

- A Project Environmental and Social Management Plan (ESMP)
- A non-technical summary written in Malagasy and French to facilitate public's access and understanding of the information contained in the study. The summary, as an attachment to and an integral part of the study, shall indicate in substance in a wording accessible to the general public the initial status of the site and its environment, the modifications made by the project and the measures envisaged to mitigate the adverse consequences of the investment on the environment.

The ESMP may be carried out by qualified consultants recruited by the BNCR and managed/supported by the ESO.

b. When an PREE is required (ONE Category 2): The BNC REDD+ will perform the following activities:

- Preparation of the terms of reference for ESMP/PREE;
- Recruitment of qualified consultants to carry out the ESMP/PREE,
- Public consultations in accordance with the terms of reference,
- Review of the ESMP or PREE and submission to the Environmental Unit of the relevant Ministry for authorization and issuance of the environmental permit.

c. When an ESMP/PREE is not required (ONE's Category 3): In such cases, only mitigation measures such as an environmental review are required. However, the project ESO shall incorporate good practices and environmental and social clauses in order to reduce risks and negative impacts that any activity could have on the environment.

Step 5: Review and approval of EIA and ESMP/PREE reports

a. Review : In the case of an EIA and an ESMP, ONE's Environmental Assessment Officer, together with the Technical Evaluation Committee members from the other relevant technical departments will review, (i) the findings and recommendations presented in the environmental and social screening forms; (ii) proposed mitigation measures in the environmental and social checklists to ensure that all environmental and social impacts have been identified and that mitigation measures have been proposed; (iii) environmental assessments carried out for the activities.

b. Approval/rejection: Based on the outcomes of the above-mentioned review process and discussions with the relevant partners and the persons likely to be affected, ONE proposes approval or rejection of the screening process that led to the classification as well as of the EIA and the ESMP themselves. Where the opinion issued is not favorable, the reasons for doing so must be clearly stated. As part of the application review, ONE may request further information from the consultant who has carried out the ESMP or from the ESO. ONE shall provide, in writing, to the BNCR/MEEF, an opinion on the sub-project's environmental feasibility.

Step 6: Public consultations and dissemination

The Malagasy environmental legislation advocates for public participation in the preparation of EIAs and their validation through public hearing. As for ESMPs, the MECIE decree calls for the preparation of a public hearing. In addition, in order to comply with World Bank OP/BP 4.01 Environmental Assessment, which outlines consultation and dissemination requirements, and as part of the World Bank's Dissemination Policy (BP 17.50), it is recommended that the REDD+ program should adopt a public participation mechanism as a component of the environmental and social impact assessment at all stages of the development of ESMPs to ensure better decision-making. A consultation process is anticipated during the preparation of any projects.

The outcomes of consultations will be incorporated into the EIA and/or ESMP reports and made available to the public. In order to comply with the World Bank's consultation and dissemination requirements, the project will have to comply with the procedure for publication by the country of safeguard instruments as practiced with Bank-financed projects. EIAs must also be approved by the World Bank and published on the World Bank's website.

Step 7: Incorporation of environmental and social provisions into the Bidding Documents and Works Implementation Documents

For projects subject to an EIA, environmental and social measures proposed in the form of environmental specifications are to be included in the tendering documents and works implementation documents for works to be performed by contractors.

Step 8: Environmental and social surveillance and monitoring

The environmental and social monitoring of REDD+ program activities is carried out within the framework of the project's general monitoring system.

Environmental and social monitoring applies both to the implementation and the operational phases of structures, infrastructure and equipment to be implemented under the project. The monitoring program may allow, as needed, for reorienting works and possibly for improving the progress of construction and implementation of the various elements of the project. Monitoring goes hand in hand with the identification of impacts and suggestion of preventive, mitigating or offset measures.

Monitoring is essential to ensure that:

- (i) Impact forecasts are accurate (monitoring of effects);
- (ii) Prevention, mitigation and offset measures are applied to achieve the desired objectives (monitoring of effects);
- (iii) Regulations and standards are complied with (monitoring of compliance);
- (iv) Criteria for the exploitation of the environment are complied with (inspection and monitoring).

Monitoring at the national level: At BNCR, the ESO will ensure that environmental and social indicators are monitored and that corrective measures are taken if monitoring findings show, for example, a

deterioration in the quality of environment or in the communities' quality of life in the zones concerned by the project. National monitoring may also involve national or international consultants for the mid-term and final assessment of the ESMF.

Monitoring at the regional level: At the regional and local levels, monitoring will be carried out by DREEF agents and/or other environmental and social focal points of deconcentrated technical services and/or local administrations. At a minimum there will be general monitoring in the field in order to anticipate and respond to potential impacts or problems.

Population Resettlement Policy Framework for (PRPF) and Process Framework (PF)

Further to the environmental and social screening, if a project triggers OP/BP 4.12 due to involuntary resettlement or restricted access to natural resources, a Resettlement Action Plan (RAP) will have to be prepared, possibly including a socio-economic study whose objective is to collect baseline information on the project's fields of activity, allowing for an economic and social evaluation of potentially affected populations/communities. The procedures to be followed for cases of involuntary resettlement are defined in the PRPF and the procedures for cases of restricted access to natural resources in the PF.

As part of the study:

- A first summary census will be carried out to identify people affected by the project,
- A detailed census will be carried out to identify potentially affected individuals (individuals, households, vulnerable groups, production systems),
- An identification of beneficiaries, disaggregated by gender, will be carried out (demographic data),
- Affected people and the impact on their properties and production systems will be determined,
- A list of affected people will be drawn up,
- An institutional analysis will be carried out and institutional arrangements for implementing the RAP developed,
- A monitoring and evaluation system will be developed.

Detailed calculations of household economics and identification of all impacts will be necessary for the social assessment and will be decisive in the potential compensation process.

Projects requiring a resettlement action plan should include measures to ensure that displaced persons are:

- a) Informed of their resettlement options and rights;
- b) Consulted and are given choices as well as alternatives that are technically and economically feasible;
- c) Provided promptly with effective compensation at the cost of full replacement of the loss of property and access attributable to the project.

Figure 28: Environmental and social impact categorization of REDD+ projects and development of related safeguards plans

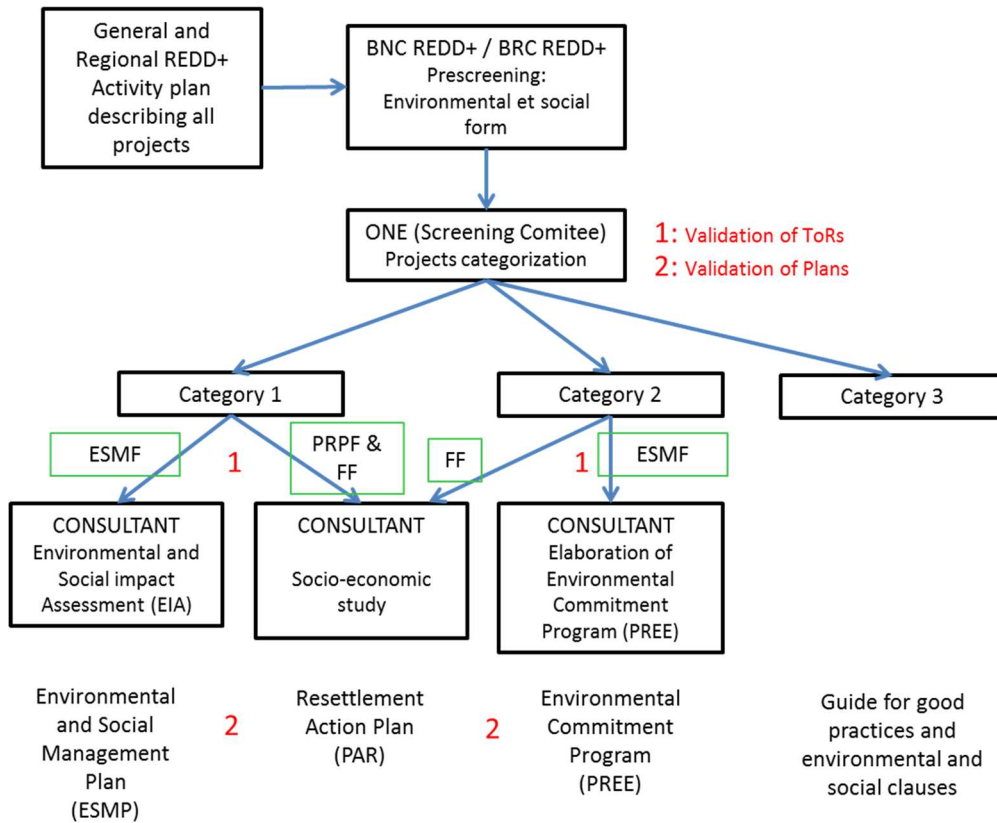
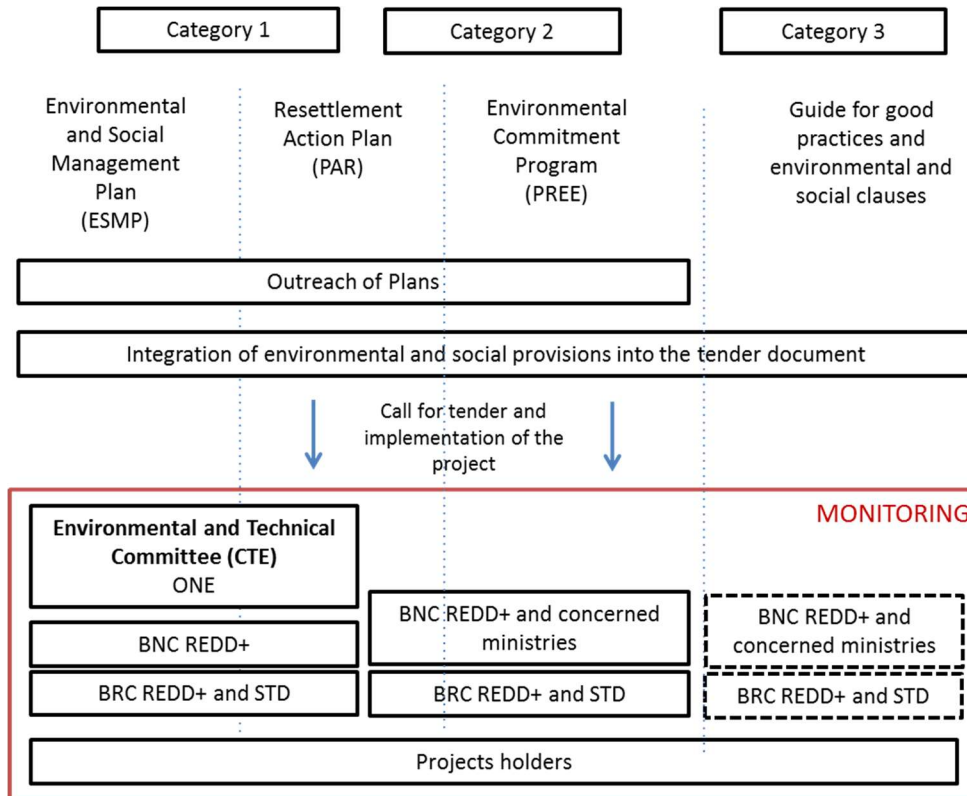


Figure 29: Monitoring responsibilities of safeguards plans



14.2. DESCRIPTION OF ARRANGEMENTS TO PROVIDE INFORMATION ON SAFEGUARDS DURING ER PROGRAM IMPLEMENTATION

Information on the proper application of safeguards and the production of non-carbon benefits⁸⁷ during program implementation will be provided through the following channels: (i) regular information posted on the Safeguards Information System (SIS) and some of them transferred to the National REDD+ Registry; (ii) a report on the monitoring of the ER-P environmental and social standards published bi-annually in order to assess the program's results and progress against each social and environmental standards principle and criterion; and (iii) an independent observer report on safeguards.

a. ER-P Safeguards Information System (SIS) and monitoring of the national principles, criteria and indicators

Regarding points (i) and (ii) mentioned in the previous paragraph, the program manager (in strong synergy with the other entities in charge of the ER-P, in particular the BNC REDD+) will be in charge of uploading into the Safeguards Information System, and for each REDD+ projects, all information on environmental and social assessments, the safeguards plans developed and the monitoring and evaluation report. The National REDD+ Registry will also make some of this information available to the public (or be directly linked to the SIS website with specific link to the corresponding REDD+ projects within the jurisdiction).

According to the type of REDD+ projects (large-scale, intercommunal or communal), specific indicators have been defined to ensure relevancy and appropriate requirements and monitoring on safeguards.

Rating system against national principles, criteria and indicators

The primary objective of the rating system is to quantitatively measure the level of a REDD+ project's compliance with the REDD+ principles, criteria and indicators for safeguards (PCI-REDD+). The methodology consists in assigning a score to each indicator, depending on the type of response obtained. Using the scores on each indicator, the arithmetic or weighted average can be calculated giving the score on a given criterion, i.e. the project's level of compliance with the criterion. The same applies to the project's compliance with the principles.

This rating system therefore allows for assessing a REDD+ project's level of compliance with:

- the set of principles
- individual principles
- individual criteria

⁸⁷ The national social and environmental standards of Madagascar describe both the minimum safeguard measures and the co-benefits expected from REDD+ activities, so this section is common with section 16.2 on the approach to providing information on non-carbon benefits.

- individual indicators

For each type of indicator (indicators requiring a letter of approval or a compliance certification, indicators requiring a report to be made available to the public, indicators requiring a qualitative or quantitative assessment of completion – e.g. percentage of complaints resolved out of the number recorded), this rating system provides for a score ranging from 1 to 3 as follows:

Compliance with REDD+ safeguards	Score
Compliant	3
Partially compliant	2
Non-compliant	1

In general, the mission of BNC REDD+ mission consists in ensuring coordination, monitoring and evaluation of activities under REDD+ in Madagascar. Thus, the SIS database management system will be centralized at BNCR that will ensure its coordination for the implementation of the information cycle, in particular data and information collection, processing and dissemination.

Data collection

Data will be collected mainly through questionnaires. To this end, the questionnaire will be sent by the SIS officer at BNCR and BRCs REDD+ to each agency/institution that is expected to generate the information as indicated in the indicators data sheet. Each data source agency will then submit the completed forms, validated by their top officer. The officer in charge at BNC REDD+ will ensure the keyboarding of completed records in the SIS database management system (the files received by the BRCs REDD+ on inter-commune and commune activities will be sent unprocessed to the BNC REDD+).

Data analysis

BNCR will process the data obtained by BNCR, which involves rating each indicator, issuing the scores for each principle and indicator, and the final rating for each project. The GTS will support the BNC REDD+ in improving the SIS from a technical point of view. It will suggest technical solutions that the BNCR will then submit to PFN REDD+.

Validation of SIS information

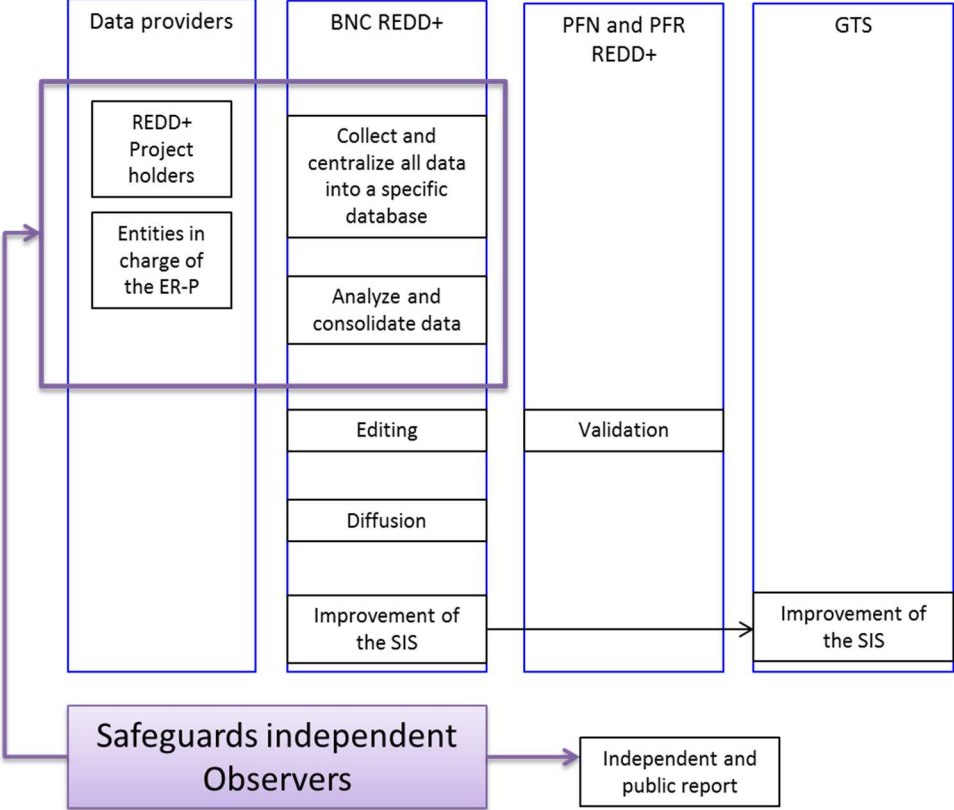
The PFN REDD+ will validate the SIS information before it is forwarded for approval to the COPIL REDD+. As such, it is in charge of controlling data and requesting modifications to BNC REDD+, as needed.

Once the report is validated by COPIL REDD+, the report will be shared publicly on the SIS web portal that is under finalization and will be hosted by BNC REDD+, with direct link to the National REDD+ Registry. This SIS web portal will also be used to compile the national report on safeguards under the UNFCCC.

b. Safeguards Independent Observer

In order to strengthen the monitoring of the program's safeguards, the Independent Observer will work alongside the civil society (who is supposed to be close to the project promoters) to verify proper enforcement of the law and compliance with standards. It will prepare an independent report containing relevant recommendations and forward it to the line Ministry for corrective action. The report will be reviewed and validated by COPIL REDD+ and published directly on the MEEF' and BNC REDD+'s website, to ensure consistency with national procedures and/or to identify national engagement or actions to be taken.

Figure 30: Safeguards Information System scheme



14.3. DESCRIPTION OF THE FEEDBACK AND GRIEVANCE REDRESS MECHANISM (FGRM) IN PLACE AND POSSIBLE ACTIONS TO IMPROVE IT

a. *Work and consultation steps for the development of the ER-P's REDD+ FGRM*

Madagascar carried out analytical studies and stakeholder consultations at all levels in several steps: (i) a review of potential conflicts and complaints under the implementation of REDD+ in Madagascar and in other projects (PA, MECIE, forest resource governance, etc.) through a desktop review and interviews with stakeholders at the national level, (ii) a national workshop to consolidate this review and launch the data collection campaign on the topic, (iii) surveys at the regional, commune and village levels to identify potential conflicts and complaints and evaluate current capacity of resolution; and (iv) a review and synthesis of all the information to categorize and prioritize the types of complaints and conflicts, develop an adequate and operational FGRM with a pragmatic guide for local use. A total of 500 people was

surveyed or interviewed in 35 ER-P communes, covering all categories of stakeholders. The sample was comprised of women at 32 percent and men at 68 percent.

b. *Identification and prioritization of potential REDD+ complaints*

Through the different consultations and interviews, 08 types of complaints were identified. Prioritization of complaints was based on two criteria: the severity of the problems (relative to REDD+) and the frequency of their occurrence, taking into account the impact of conflicts on (i) the state of natural resources and therefore the potential results of REDD+, (ii) the social environment, and (iii) the economic environment.

Complaints and conflicts can be grouped according to different criteria: geographical level, significance and impacts, frequency, parties involved, object of conflicts etc. Thus, complaints were grouped into eight categories, listed in Table 31 by order of significance.

Table 31 - Categories of complaints

Type of complaints related to the:	Description
Use of resources	Mainly pertain to restriction of access to natural resources, encroachment of land use, misunderstanding on land uses, persistence of unsustainable natural resource management and exploitation practices.
land tenure	Transfers of natural resource management, the creation or expansion of protected areas, poor land-use coordination/planning, including reforestation, and restrictions on land access, are often at the root of land disputes. Needless to say, these come with the social and traditional causes of land conflicts that are linked to the poor operation of the land system in Madagascar: inheritance, sale, problems with the administration, etc
non-compliance with commitments	Failure to fulfill commitments by the State, regional officials or project managers may cause poor relations with communities and populations and often cause complaints and criticisms, which affects the communities' participation and the success of projects. Frustrations are expressed mainly in relationship with the compensation that are often considered insufficient if not non-existent
law enforcement	Non-enforcement of laws is felt at all levels and generates conflicts generally between citizens and the State or even among community members
governance	Problems related to governance are numerous and result in more or less serious conflicts. Citizens often complain about poor governance. The forestry administration is very ill-perceived, although all other sectors of the administration are not in better position; corruption, trafficking in influence, abuse of power, nepotism, embezzlement, lack of transparency, etc. are commonplace and stand as obstacles in the path to development. Unfortunately, the VOI are not free from these scourges either
inequity	Exists when there is undue injustice. This occurs in the management of natural resources when there is no equitable sharing of costs and benefits

	of actions or when there is unequal treatment. Conflicts due to inequity even affect VOI
Social conflicts	more or less related to forest management such as economic activities, pollution and nuisances, infrastructure management, etc
Cultural and religious	When certain agricultural and socio-economic practices are anchored in traditions and customs that are still very much practiced in areas close to forests, such as <i>tavy</i> (slash-and-burn farming) in some parts of the island. On the other hand, conservation or development projects as well as investments may also stumble upon cultural or worship problems. Finally, it should be noted that culture may act as an obstacle that prevents people from filing complaints or voicing their views

c. *Current conflict response and resolution capabilities*

The Malagasy legal framework for the management of complaints is well documented and is comprehensive, although there are still gaps that the ER-P wishes to fill. Systems and structures to manage complaints related to resource management exist and are moderately operational (there are a number of specific regulatory texts: decrees, ordinances, decrees), but for the ER-P to better succeed in terms of environmental, social and economic context, they should be adapted to the context of REDD+ and the challenges associated with REDD+. To ensure that all structures will be operational, capacity building will be provided at all level and specific guide and protocol will be developed in the next months. The TSS of each BRC REDD+ will ensure that all stakeholders involved in REDD+ projects are familiar with the mechanism. Specific FGRM guides explaining all processes and formalities. It will be distributed to all communes concerned by REDD+ projects.

It should be stressed that the surveys carried out have allowed for identifying how complaints are handled in the field. Various entities and structures are involved, in particular traditional authorities and structures (*tangalamena*, *olobe*, etc.). Traditional authorities, which are the guardians of social peace in their jurisdiction, play a very important role in solving social conflicts, alongside *fokontany* and heads of *fokontany*, and communes (mayor, chair of the municipal council or the municipal council, as appropriate). Traditional authorities' jurisdiction in the resolution of conflicts is fairly broad: social conflicts, land conflicts, conflicts related to natural resources. They work in collaboration with VOI (KMD) and heads of *fokontany* for the enforcement of *dina* (collective agreements).

Generally, conflict resolution occurs at four levels,

1. It starts at the level of the *Tangalamena* in the *fokontany*
2. Hamlets or villages (usually in the communal house or *tranobe*) through traditional methods,
3. The conflict moves then to the head *fokontany* in case of non-resolution and is still addressed amicably,
4. It then goes to the level of the commune that plays a role of conciliator via the municipal council.

At the local level, *dina* related to management transfers are enforced by VOIs before any step is taken with the competent authorities in case of infraction linked to natural resources. The customary system of

conflict resolution is also involved in the enforcement of *dinas* in general when such system exists. However, the enforcement of registered or unregistered *dinas* is rather limited in most of the communes surveyed. *Dinas* exist at the local level, especially to address the issue of insecurity, but local authorities are reluctant to apply them for a variety of reasons: the context of crisis, the poverty of the population, and so on. Moreover, local authorities are not always inclined to adopt and enforce *dinas* (communes and fokontany) given the contrasts with the legislation. Thus, it is important to promote the adoption, registration and enforcement of *dinas* at the local level. Similarly, the advent of the *dinabe*, usually at the regional level, is an element to be taken into account.

d. *Current legal framework for ER-P FGRM*

The approach builds on analysis existing structures and characteristics and the related legal documents to identify the most appropriate REDD+ FGRM. Review of the other structures whose specific missions in the field of complaint management have been conferred by specific texts, such as the Ombudsman of the Republic, the Interministerial Committee on the Environment (CIME), the Environmental Cells of the Ministries, the Regional Management Committee Environmental Complaints (CRGPE), the Mining Forest Commission, etc are also included.

Related to the legal frameworks, roles, responsibilities and complaints handling capabilities analysis of each structure identified in relation to the management of complaints was carried out. As to the way complaints are handled, they have been deduced from current texts and practices. The strengths and weaknesses were established on the basis of the stakeholder opinions gathered at the regional workshops and the analysis of experts within the NEB (see Annex V).

National level

- Order n° 92-012 of 29/08/92 establishing an Ombudsman of the Republic, defender of the people; ;
- Decree n° 97-823 of 12/06/97 establishing, organizing and operating the Interministerial Committee on the Environment (CIME);
- Decree No. 99-951 of 15 December 1999 on the establishment, organization and functioning of the Inter-ministerial Coordination Committee of the Program "Local Community Management of Vegetation Fires in Madagascar
- Decree No. 2003-439 of 27/03/2003 establishing an Environmental Unit within each Ministry
- Decree n ° 2014-906 of 24/06/2014 creating the Interministerial Committee in charge of the reorganization of the rosewood and ebony wood industry
- Decree No. 2015-629 of 07/04/2015 establishing a National Commission for Integrated Management of Mangroves;
- Decree n ° 2015-957 of 16/06/2015 relative to the Local Structure of Consultation of the Decentralized Territorial Communities
- Interministerial Order n ° 7340/2004 of 16/04/2004 establishing an Interministerial Committee on Mines and Forests (CIMF), amended by the Interministerial Order n ° 12720/2004 of 08/07/2004;
- Interministerial Order n ° 2007/2013 - VPDAT / MEF of 04/02 2013 establishing, organizing and operating the Interministerial Land and Forests Committee;
- Interministerial Order n ° 52004/2010 of 20/12/2010 establishing, organizing and operating the Madagascar Protected Area System Commission (SAPM);
- Ministerial Decree No. 14569/2016 of 12/07/2016 on the establishment, organization and operation of the REDD + Platform in Madagascar;

Regional level

- Regional Order n ° 009/08-REG.ATS. of 26/02/2008 appointing the members, setting up, organizing, operating and awarding the Regional Environmental Monitoring Committee of the Atsinanana Region (CSER);
- Regional Order n ° 010/08-REG.ATS. of 26/02/2008 appointing the members, setting up, organizing, operating and awarding the Regional Environmental Liaison Committee of the Atsinanana Region (CLER);
- Order No. 005/07 / REGION / ANOSY / ONE of 10/07/2007 appointing the members of the Regional Environmental Monitoring Committee of the Anosy Region (CSER);
- Regional Order n ° 24-RGA / CR / 07/08 of 10/07/2008 establishing a Regional Committee for the Management of Environmental Complaints in the Analamanga Region (CRGPE Analamanga);
- Order n ° 029/2008-Rég.Ats of 03 July 2008 establishing an Environmental Complaints Management Committee (CRGPE Atsinanana)
- Order n ° 164/2015 / REG of 21/08/2015 establishing the Regional Environmental Unit ANOSY;

Local level:

- Law n ° 2001-004 of 25/10/2001 on the general regulation of *dina* in matters of public security;
- Decree No. 96-898 of 25/09/96 establishing the powers of the Mayor
- Decree No. 2000-027 of 13/01/2000 on the grassroots communities responsible for the local management of Renewable Natural Resources
- Decree No. 2000-028 of 13/01/2000 concerning Environmental Mediators
- Decree n ° 2004-299 of 03/03/2004 fixing the organization, the functioning and the attributions of the Fokontany;

e. *Definitions of the fundamental principles of the ER-P FGRM*

The main challenge in designing and implementing the REDD+ feedback and grievance redress mechanism is therefore to integrate the traditional system into the modern system that, among other requirements, imposes registration, traces and formalities. The other challenge of the FGRM is related to *dinas*: they are also recognized and useful for the management of certain categories of conflicts at different levels, but the issue of their non-registration and the advent of regional *dinas* raise questions or even reluctance towards them.

The data collected from the stakeholders were reviewed to develop this REDD+ FGRM in Madagascar. In the course of its development, other parameters and criteria have been integrated in order to ensure the mechanism is optimal, effective, efficient and relevant in relation to local contexts.

The new FGRM for REDD+ Madagascar is a complete mechanism that combines compliance with the international standards and prerequisites. More importantly, this new FGRM takes into account the local realities of Madagascar and the ER-P, and gender mainstreaming makes this new FGRM an equitable tool for all stakeholders, including women and vulnerable populations.

Criteria for the development of the FGRM				
Surveys and review of existing mechanisms and legal/institutional framework	SESA and E-RP activities	MF of FCPF and UNREDD criterion	Gender mainstreaming	World Bank's safeguard police (cf. section 14.1)

Validity of a complaint

Within the framework of the ER-P and REDD+ projects, to be valid, a complaint must relate to issues related to the activities undertaken by the ER-P and the REDD+ projects. Therefore, it is essential that all stakeholders in the REDD+ process have a clear vision of these activities. Complaints or feedback on issues related to ER-P activities and REDD+ projects may be referred to other competent bodies, but the REDD+ program or projects may not accept liability for the way other institutions deal with such complaints.

Nature of complaints about the REDD+ program and projects and other related aspects

The ER-P and REDD+ projects' FGRM handles complaints about all issues ranging from the rights of relevant actors and stakeholders to the most serious grievances, such as corruption in managing the benefits of REDD+. For complaints to be properly managed, it is essential to classify them as "sensitive" or "non-sensitive" in nature in relationship with the risks incurred by the complaint. The defining criteria will be specified as part of the process so that there is a consistent application of the categorization across the ER-P Area. When complaints occurred, the complainant has right to classify the complaint as "sensitive" or "non-sensitive". When complaints occur, the complainant has right to classify the complaint as "sensitive" or "non-sensitive". These instructions will be included in the user's guide mechanism for each step. A complaint of a "non-sensitive" nature relates to a problem whose complaint does not negatively affect the social relationship of the complainant. On the other hand, a complaint is classified as "sensitive" if the potential impacts are detrimental to social relationship or security of the complainant.

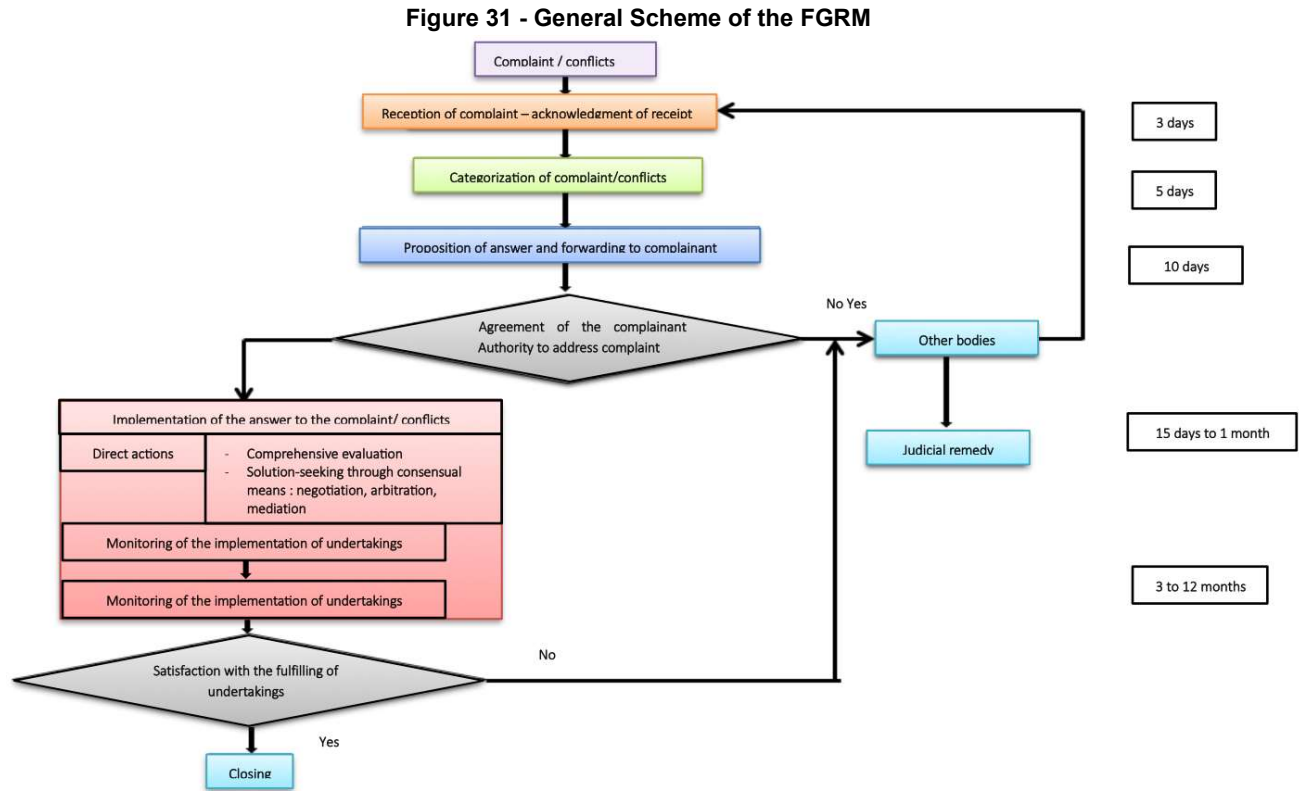
Assuring complainants that complaints of a sensitive nature are processed confidentially and without risks of retaliation by the bodies involved to the complainant gives them the assurance that they benefit from certain level of protection. It is therefore important to inform stakeholders of how each type of complaint will be handled in accordance with local, regional or national organizational policies and practices, as appropriate.

Obstacles preventing people from raising concerns or complaints

Parties that are potentially directly or indirectly affected by the FGRM (complainants, bodies involved in the implementation of the FGRM, entities involved in the complaint) may face problems or "obstacles" that impede their will or ability to file a complaint. Information from the stakeholder analysis has been used to identify the most effective means of minimizing or overcoming such obstacles, but also to consult and involve a wide range of stakeholders, particularly those who are often marginalized or most vulnerable in order to ensure that they can voice their concern or file a complaint in a safe and confidential manner.

f. *Description of the steps of the FGRM of ER-P*

The FGRM model of E-RP that encompasses all international, national, regional, and local principles can be generally summarized as in the following block diagram:



The FGRM of E-RP breaks down into the different steps described hereunder in general terms, i.e. with no consideration of type or scale of implementation of the complaint under consideration (*fokontany*/local, communal, district, regional, national). Annex V details the current proposition for implementing the REDD+ FGRM of E-RP, describing the roles of potential REDD+ actors according to the type and location of the complaints. This near-final version of FGRM will be further improved over the coming weeks, especially owing to the work of GTS and BNC REDD+, as well as through consultations with PFN REDD+ and PFR REDD+.

Reception of complaints and feedback

The FGRM will offer several channels and different formats for filing complaints or giving feedback on the implementation of the mechanism, e.g. a complaints box, phone number, letters, trusted person, community assemblies, etc. Although the different options offered will be decided in consideration of the stakeholders and local context, it is critical to ensure that each one of them is understood and accepted by the stakeholders and different entities involved in the implementation of the mechanism. As such, the development of ER-P over the coming weeks will focus on developing, for each entity, clear procedures

approved by the national administrative body of FGRM on how to group complaints, register them in a centralized system, and manage them in a standardized manner.

Categorization of complaints

Depending on the location of issuance of the complaint, the body in charge of handling it under the implementation of GRM will need to establish the "type" of complaint it belongs to and select the policy or procedure to be implemented to assess its eligibility. Complaints will be classified according to their level of *sensitivity/priority* for the success of the REDD+ program and projects, so as to ensure that they will be addressed in compliance with the appropriate policy and procedures. Complaints will be processed per type: sensitive or priority complaints may require a confidential inquiry; complaints that are not sensitive in nature will more probably be solved faster by making the necessary changes.

Once the complaint has been categorized, the complainant will be notified at the earliest opportunity, preferably with an acknowledgment of receipt, clearly setting out the way the complaint will be handled and potential outcome of the process. Where a complaint is not sensitive in nature, an answer should be provided within a relatively shorter period of time (e.g.: one week), whereas sensitive/priority complaints may require a relatively longer period of time due to the higher complexity of the investigation processes.

To properly manage the expectations of the people filing complaints, the ER-P needs to make sure to set short response deadlines and clearly signal them to complainants, as well as potentially concerned parties. Answers should, to the extent possible, be given verbally, as well as in written and registered by the body that assessed the eligibility of the complaint to allow for verifying that a complaint has been answered and followed up.

Furthermore, the complainant may provide feedback by expressing "feedback" or concerns on the decision made to the body that assessed the eligibility of the complaint. Where applicable, the GRM of ER-P will need to consider this feedback for the purpose of transparency of the procedure.

Processing of complaints and inquiries

Complaints will need to be processed and investigated to establish their validity, the aspects where non-compliance occurred, and the actions that should be taken in response. It falls to the body processing the complaint to decide how to conduct an inquiry on the complaint. The body in charge of processing and investigating a complaint should consider the following key points.

Jurisdiction	Transparency	Confidentiality	Impartiality
The inquiring body should have authority to take and/or make appropriate action and/or decisions and implement them.	It is important to ensure the transparency of the relevant procedure. This includes the composition of the investigation team and the identity of the decision-makers. All important decisions made must be clearly explained.	Confidentiality is critical, especially when the complaints are of sensitive nature. Any disclosure of information should be kept to what is strictly necessary to protect the parties involved.	It is crucial to ensure the impartiality of the body conducting the inquiry to guarantee equal treatment of the complaints and answers provided to them. If people involved in the processing of a complaint have a direct interest in the outcome of the investigation, they should recuse themselves to avoid damaging the credibility of REDD+ GRM and causing further concern or prejudice to the affected people.

The investigation of sensitive/priority complaints will be conducted in compliance with applicable organizational policies to ensure confidentiality. For example, a complaint for financial corruption relating to the sharing of REDD+ benefits is conducted in compliance with the REDD+ program and projects procedures for fraud. If the complaint pertains to a situation that falls beyond the remit of the REDD+ program or projects or their partners, it can be referred to a competent body or authority or other relevant organization. In this case, FGRM will need to advise and orient the complainant on the procedure to be followed.

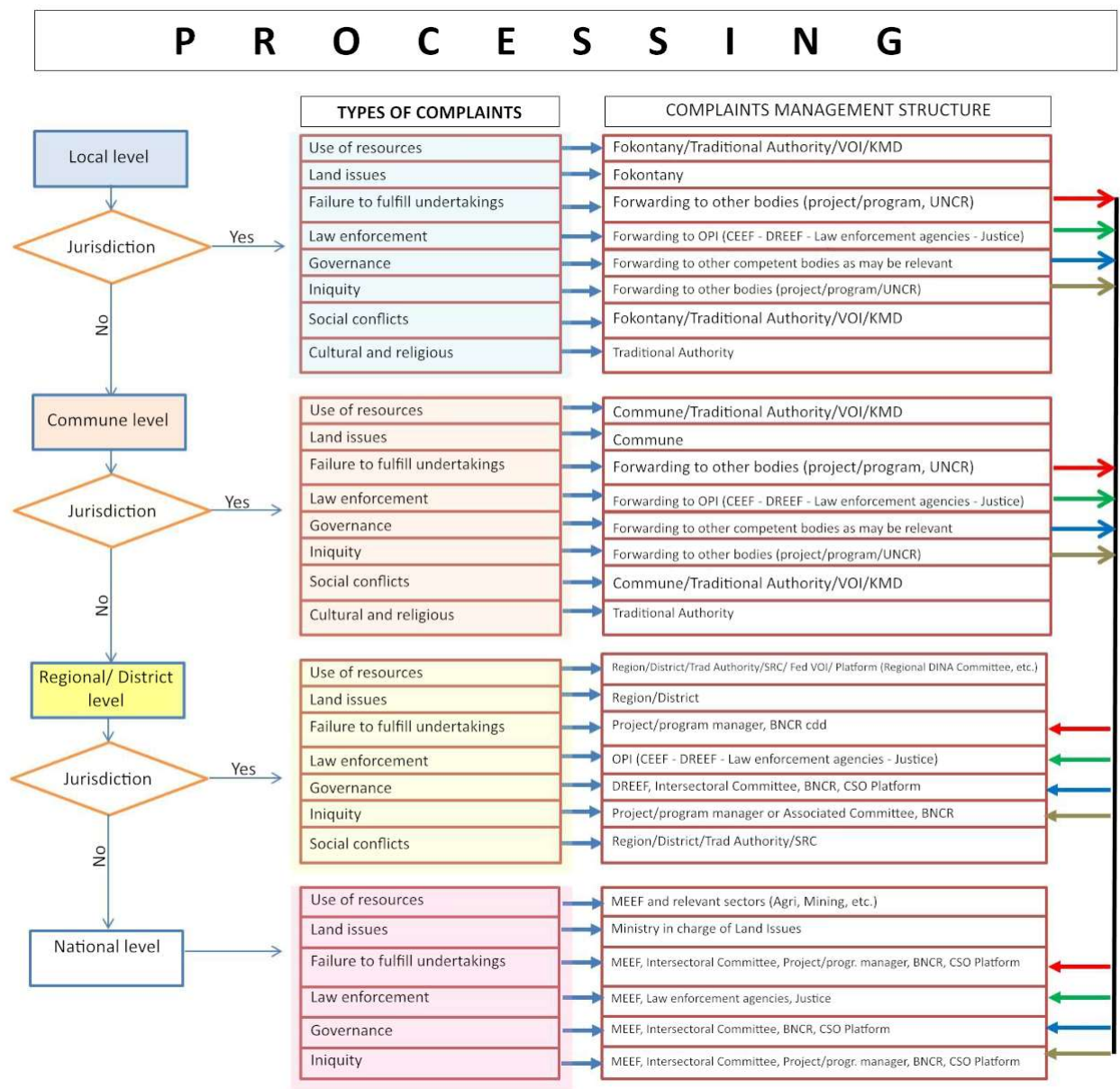
Sensitive/priority complaints may require the setting up of an investigation body to conduct specialized investigations, so as to prevent damages and maintain the integrity of FGRM. Where the complaint pertains to a criminal or legal issue, FGRM shall refer its management in accordance with appropriate procedures to the relevant judicial authorities.

Since some investigations and answers may have significant consequences for the REDD+ program and projects and/or the partner and/or the complainant, the body conducting the investigation shall assess the

risks and implications that they involve. To what extent is the complainant (program/ REDD+ projects/ partner) ready to face the consequences of the investigation? What role will the complainant be playing? Will he/she be willing to publicly voice his/her concern? Under which circumstances would the REDD+ program or project/ partner or complainant choose to put an end to or discontinue an investigation?

Anonymous and malicious complaints or rumors may indicate that people wish to raise other concerns but they hesitate or are unable to voice them openly or doubt the integrity of FGRM. These are warning signs that may be useful to the body in charge of the investigation and that FGRM should be able to identify. If all stakeholders accurately understand the purpose and operation of FGRM, potential practical difficulties in implementing FGRM may be minimized.

Figure 32: Diagram explaining the processing of a complaint



Answers and action-taking

Once a complaint has been processed and investigated, something needs to be remedied to, modified, or changed, to improve the situation or address the problem. A formal complaint requires a prompt answer from the authority processing it. FGRM should clearly communicate the results of investigation process to the complainant and duly keep him/her informed of the actions that will be taken following any decision made. It might prove necessary to inform other parties of the actions that will be taken if the latter were also affected. Answers may be given in written or verbally, according to what has been agreed with the complainant and they should be documented. Like earlier, the person and parties affected may respond or make claims in relation with the actions taken by the body that conducted the investigation. The body that conducted the investigation needs to take the feedback given by the complainant or parties affected by the actions into consideration.

Appeal procedure

Where the complainant is not satisfied with the answer and involved parties fail to find a solution, the complainant may decide to refer the matter to a higher-level authority. The appeal procedure allows for reassessing an already completed investigation and establishing whether the initial decision should be maintained or if a new one should be made on the basis of the findings of the reassessment.

The appeal procedure should be clearly defined, i.e. in which cases it may be used, how it will unfold, and which parties are involved. The purpose of the appeal procedure, where applicable, is to verify the appropriateness of the initial decision or answer.

The appeal procedure should be implemented by bodies and entities other than those that performed the first investigation to prove the impartiality and security of the procedure to complainants and foster trust in FGRM.

An excessively high number of appeals may indicate a problem either in the initial FGRM procedure or in the implementation of the REDD+ program or project. A closer look at matters may prove necessary.

Resolution

There is resolution when all parties involved in the complaint reach an agreement and, more importantly, the complainant is satisfied that the complaint has been addressed in fair and appropriate manner and the actions taken bring a solution.

Monitoring and registration/ tracking at each step of FGRM

To ensure the surveillance and management of the complaints received, FGRM will monitor and register the key steps of any complaint process. This way, it will be in position to easily identify the number of complaints received, the body that received them, their place of issuance and person issuing them, the subject matter of the complaints, when and how they were answered, and the actions that were taken to address them. FGRM will need to perform a one-off analysis of the data collected depending on the schedules and key events of ER-P, to make out the trends of the results and identify any changes that

should be contemplated. The tracking of the answers can help feed the evaluation process and allow for learning and, where necessary, making adjustments to FGRM and/or REDD+ projects/program.

Monitoring and evaluation of FGRM itself

To determine if the FGRM operates as planned, it is essential to set up a procedure for the surveillance and review of FGRM itself. The surveillance should allow for ensuring the monitoring and analysis of complaints, access points, formats uses, investigation procedures, and answers given. It allows for checking the operation of the different elements of the mechanism, especially if stakeholders understand their rights and are in position to use and understand the system. It also allows for bringing means of improving it. Additionally, the system should periodically undergo a full evaluation aimed at detecting any issues in the processing of complaints or answering of complainants. This evaluation should be entrusted to an independent organization to guarantee objectivity and legitimacy.

The FGRM procedures may then be reviewed, its approaches adjusted, and the system improved to ensure effectiveness. During the FGRM review, it is important to check that the following principles are implemented:

- **Participation** – Check how the different parties participated in the implementation and surveillance of the system. Ensure that FGRM reaches the target groups of the REDD+ program and projects and that it does not discriminate against or excludes the populations that the REDD+ program or project wishes to work with by emphasizing the gender and vulnerable and marginalized group aspect.
- **Adaptation to the context** – Check that FGRM is adapted to the context and culture of the region and locality where the activities are implemented. Ensure that FGRM is adapted to the implementation or execution arrangements of program activities.
- **Information accessibility** – Ensure that the information is disseminated in a way accessible to all relevant stakeholder groups. Check if these stakeholders know what the REDD+ program is about and whom it targets, how the FGRM process works, and how they can access it. Is the information displayed in a way that is appropriate to the targeted group of stakeholders? E.g. If the populations are for the most part illiterate, the information should be displayed in the form of pictures or diagrams. Is the dialect appropriate and easy to understand?
- **Transparency** – Ensure that the purpose of FGRM, its limits, and the operational mode of the system are clearly explained. If, for example, several complaints received do not directly relate to the REDD+ program/project, this may indicate a problem in the reference information provided. It may prove necessary to review the way the information is communicated and correct the approach/methods used to clearly explain to complainants and parties affected by the complaints what they can expect.
- **Accessibility and procedure security** – It is critical to give each person and body the feeling that they can safely access the system and are not exposing themselves to any risk by using it nor risk any harm by filing a complaint. This applies to the stakeholders affected by the REDD+ program and projects or other stakeholders.
- **Independence, confidentiality and no retaliation** (where applicable) – It is essential to consult with stakeholders affected by the REDD+ program and projects to know their perceptions on the

different procedures of the mechanism, as well as on any revision they wish to make to ensure confidentiality and prevent any feeling of threat or reluctance to use the system.

- **Responsibility taking** – If a body involved in the implementation of FGRM manages to demonstrate that it takes complaints and feedback seriously, listens to what it is told and this is reflected in its way of working, it has high chances of reinforcing the trust that the parties involved or affected by the complaints and other parties have in it. There are higher chances that people will keep on resorting to FGRM if they notice that the fact that they are talking openly about their concerns can directly impact on the situation.
- **Appropriate capacities, values, attitudes, and behaviors** - Check that the authorities involved in the implementation of FGRM are perceived to have a system. Do they value this and show it in their way of behaving and working with stakeholders affected by the REDD+ program and projects or other stakeholders? These authorities may not trust the system and will not necessarily be eager to implement or promote it. The REDD+ program coordination body also needs to show that it values the system and lessons to be learned from it.

Action plan for the finalization and implementation of the FGRM of E-RP

Currently and in parallel of the finalization of the design of FGRM, a guide intended for the authorities involved in the implementation of FGRM as part of ER-P activities is being developed and should be finalized by the end of 2017. Additionally, a capacity building plan is in the process of finalization and will be implemented by the end of year 2017.

The ER-P will need to provide for the funding of FGRM. An indicative budget to reinforce such a complaints mechanism is proposed in the financial plan of the program.

15. BENEFIT-SHARING ARRANGEMENTS

15.1. DESCRIPTION OF BENEFIT-SHARING ARRANGEMENTS

a. *Specificities of the ER-P*

Up-front investments

As mentioned previously (see section 6.2 and 13), available and up-front funding cannot cover the overall area of the program, thus making, at each phase of carbon revenue generation, investment into new activities a priority for its continuity, following the evolving approach mentioned in section 4.3. While carbon revenues are envisioned to provide a major part of this necessary investment in new activities and expansion to cover the full area of the ER-P, Madagascar will continue its effort to identify and attract additional up-front investment from other sources (private sector, other international agencies or donors).

In comparison with different REDD+ contexts and countries where single value chains (within agricultural or forestry sectors) or operators are responsible for an important part of deforestation, in Madagascar and even more in the Eastern Humid Forest, agents and drivers of deforestation are highly diverse (see section 4.1). They are generally characterized as having a relatively small-scale impact individually, but spread almost everywhere. There are almost no large-scale operators exploiting natural resources with major land holdings from which the ER-P could encourage investments and easily modify practices.

However, one category of stakeholders has an important share of territorial management across a broad area: delegated entities in charge of Protected Area management (MNP, WCS, CI, and to a lesser extent MBG) that have the responsibilities to ensure financial perpetuation of PAs and their community management system. However, it should be emphasized that in each of these cases, while the entities listed above have been delegated or assigned management responsibility for specific forest areas, these forests belong to Madagascar. The REDD+ program aims to ensure their continued protection into the future by including them in its priority conservation planning, and to leverage their success in reducing forest emissions as an engine of revenue generation to finance the early years of the jurisdictional program.

- Makira and CAZ are generating emissions reductions from existing jurisdictions corresponding to conservation areas and they have their own respective benefit sharing mechanisms. They cover an area of about 730 093 ha and should generate around 4,113,270 tCO₂ of ERs over the first 2 years, corresponding to around 65% of the ER potential of the ER-P to be sold through the ERPA;
- MNP and MBG are respectively responsible for areas covering 279,612 ha and 7,129 ha of the accounting area. They should generate 1,362,435 tCO₂ of RE over the first two years.

An important part of up-front investments will be realized through the PADAP at landscape scale. The PADAP covers 3 watersheds in the jurisdiction for an area of 727,201 hectares over 29 communes with 54,000 inhabitants. Over the first two years, it has been estimated that the PADAP would generate 861,940 tCO₂ of ERs, which constitutes 20% of the total ERs potential to be sold after the first verification. But

unlike protected areas that are already implementing activities, PADAP will really only launch activities by the end of 2017. Thus, ERs from PADAP will have a net increase during the 5 first years of the ER-P, as activities begin to demonstrate results. For instance, in 2022 it is estimated that PADAP will generate 45% of ERs of the program, to be compared with the 20% over the first two years.

CASEF projects will also invest in over 886 hectares of the ER-P in agricultural activities in order to decrease deforestation, but also in afforestation in the region of Atsinanana and Analanjirofo, with a potential of 107,000 tCO₂ of ERs.

Institutional arrangements for benefit-sharing

The institutional arrangements for the ER-P in Madagascar reflect a system that includes multiple actors and levels that are involved and, unlike in other programs, do not hinge primarily around a single commodity or governmental agency. While there are different payment schemes that have been piloted or are active in Madagascar such as PES, national environmental foundations, REDD+ projects, they have not been applied to the level of a national or jurisdictional scheme.

The structure for benefit sharing for the ER-P thus incorporates lessons from the different mechanisms and is adaptable based on the presence of different actors that are more or less involved in a given area including local communities, conservation agencies, private sector actors, local governments etc.

Institutional arrangements for benefit-sharing are linked to general institutional arrangements of the ER-P described in section 6.1, and will not involve external entities. The PFN REDD+ discussed the possibility to use the Local Development Fund (FDL) because SLCs are the consultation entities responsible for it, but so far FDLs have not been used widely, and proof of their efficiency and capacity to ensure ER-P's objective are not established. Use of these entities should be incremental, at first used over a limited scale and through a learn-by-doing process and then scaled up as they become more effective. This option is currently under assessment by both the government and the PFN REDD+.

b. General principles of the benefit sharing mechanism

This section provides information on the general principles of the benefit sharing mechanism as developed with stakeholders and for all new or existing REDD+ project within the jurisdiction (and described in section 6), but does not take into account specificities of benefit sharing regarding the two REDD+ pilot projects.

All information included into this section is the result of intensive discussions and debates between stakeholders of the PFN REDD+ and PFR REDD+, and has been agreed and supported by the REDD+ Platform, the formal body for broad stakeholder engagement in REDD+ at the national level.

The different types of benefits generated within the ER-P

During the phase of redistribution of **carbon related monetary revenues**, incentives can be done through funding of projects in order to generate ERs, but also through the reward systems explained in section 6.2.

Institutional arrangements of the ER-P need to allow sharing (i) these **monetary benefits** among beneficiaries (project funding and linked rewards) with specific financial flows procedures, but also (ii) **non-monetary benefits** in the form of goods and services funded within each project.

Non-carbon benefits are described in section 16. These benefits are critical for addressing the varied needs of stakeholders. This is specifically true for rural populations that are mainly searching for (i) increased revenues due to monetary flows into projects that will allow them to integrate new or improved value chains with better access to markets, and for (ii) non-monetary advantages like securing land tenure or reinforcing governance.

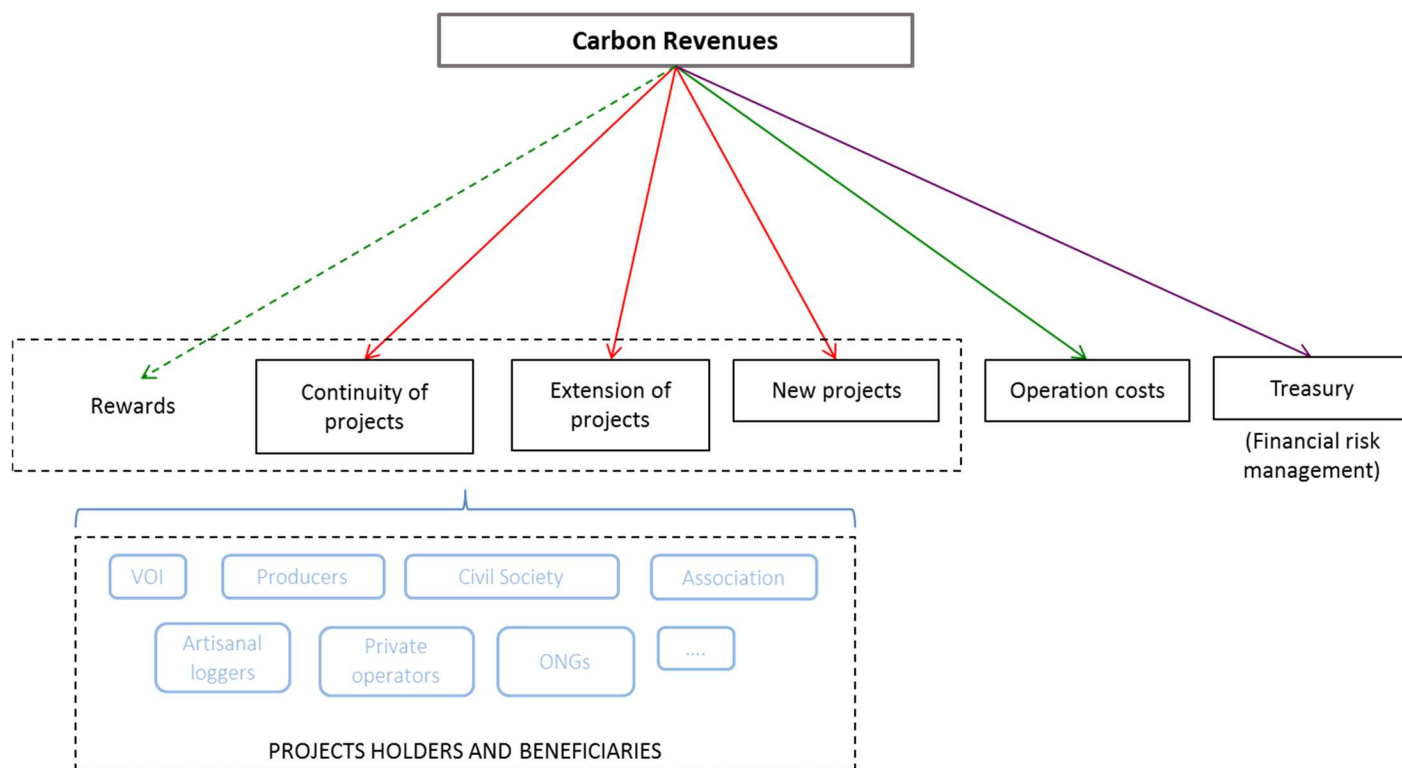
These benefits have the advantage of being disconnected from carbon performance measured at the level of the jurisdiction. They will be materialized even in situations of low performance of the program. Non-carbon revenue flows will have to be taken into account during the planning phase of projects and will be evaluated during their implementation.

Sale and reinvestment phased cycle of the program

After each sale of ERs, carbon revenue utilization will have to prioritize the development and continuity of the program and current projects in the jurisdiction. Allocation of revenues will address not only actors directly engaged in emissions-reducing activities, but also will seek to address the needs identified and prioritized by all stakeholders at each level (see section 6.2). The main flows of revenue allocation are:

- Program operation costs;
- Treasury
- Continuity of existing projects (or part of their activities);
- Geographical or thematic extension of existing projects;
- New projects;
- Rewards, dedicated to social and development investment. This allocation will be contractually linked to each project.

Figure 33: Financial flows of revenue allocation



Program costs and potential risk of low performance of the jurisdiction

At each cycle of carbon revenue generation, ER-P operational costs will have to be covered by carbon revenues (see for more details estimated cost in Annex II).

Part of the carbon revenue will have to be set aside as treasury in order to cover the risk of under-performance of the program during a phase and preserve the ability of the program to fulfil its commitment to sub-projects (like REDD+ pilots). This treasury system is currently under design and will be operational by the start of implementation of the program.

Simultaneously, to address the case of disproportionate contribution and earnings by particular projects, such as the currently active Makira or CAZ projects, it is envisioned that a minimum level of revenues, based upon program performance and demand for Program ER's, will be fixed for sharing with those projects through their existing BSM so as to ensure the durability of activities and continue to incentivize the COBAs who are the primary producers of emission reductions in these zones.

Fundamental principles of benefit sharing mechanism

Underlying principles and decisions taken by the PFN REDD+ for the benefit sharing arrangements are:

- Effectiveness: incentives provided by the program support actions that substantially reduce emissions due to deforestation and forest degradation, and conserve and increase forest carbon stock;

- Efficiency: incentives provided by the program are reducing emissions and increase absorption with low cost. This is a reason why “large-scale” projects have been considered as an option, when scaling up of a project is allowing “economy of scale” cost reduction while providing equivalent ERs to the sum of separated regional projects. When possible, transaction costs should be minimized.
- Equity: incentives are shared fairly, especially when providing benefits for the most vulnerable populations.
- Performance and non-performance criteria: REDD+ revenues will be allocated between projects according to ex-post and ex-ante performance criteria measured with proxy indicators. Results of existing projects will be described in activity reports of projects at each level (see section 6.1), and new projects will be selected according to estimated results in terms of ERs, among other criteria. However, and due to geographical inequality of up-front investments, some criteria not related to performance will also be taken into account when new projects will be planned (see section 15.2).
- Prioritization of carbon revenue allocation at two levels: both PFN REDD+ and PFR REDD+, respectively at national and regional level, will be responsible for allocating carbon revenues among the following categories:
 - Continuity of existing projects (or part of their activity) that have proven their performance and are lacking of funding for their perpetuation;
 - Extension of projects that have proven their performance and still have necessary funding for their perpetuation, but that could be extended to a bigger area or need additional activity type to increase their performances;
 - Investment into new projects in the jurisdiction based on an analysis of high-priority landscape or communes.

Concerning the reward system, and in order to sustain or increase the incentive effect of projects for local populations, reward activities (with an important social or economic impact) will be identified during the planning phase of the project reducing ERs, and these reward activities will be included and described within the technical offer or project document. Funding will be made available as a “final payment” when the central project will have shown that (i) all efforts were provided for the project success, and that (ii) the estimated ER performance has been reached. Detailed procedures will be developed, but ongoing discussions are planning to cap the budget necessary for these reward activities according to a percentage of the total budget of the project necessary to reduce ERs.

For the nested projects with existing benefit sharing mechanism, the objective is to protect existing investments and systems while contributing to the overall functioning of the program. The details of these arrangements will be discussed between the BNC-REDD and project developers in coming months and will be confirmed before Program implementation commences.

c. Phased planning for REDD+ revenues benefit-sharing

In order to accelerate project implementation once carbon revenues are received at central level, the planning of projects will be done in two\ phases: the first, will consist in planning according to ex-ante estimation of ERs to be generated during the current phase and corresponding carbon revenues that will be available for the next cycle— a two-year period corresponding to the time between ER verifications

and; second, consisting of an identification of new projects or expansion of existing projects to be implemented according to available carbon revenues.

The following figures illustrate this phased process with details of entities involved in each step, with a separation between the first and anticipated phase of project planning, and the second phase after reception of real carbon revenues separated in two scenarios: (i) when carbon revenues are lower than expected, and (ii) when carbon revenues are substantially higher than anticipated.

Figure 34: General approach for benefit sharing phased approach

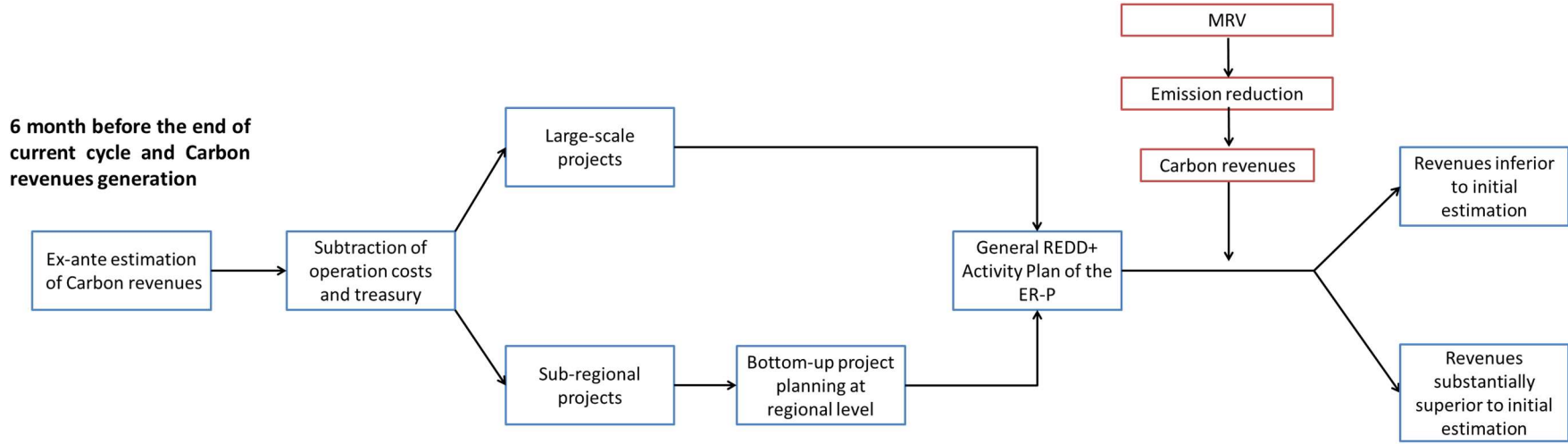


Figure 35: Ex-ante planning of projects within the ER-P

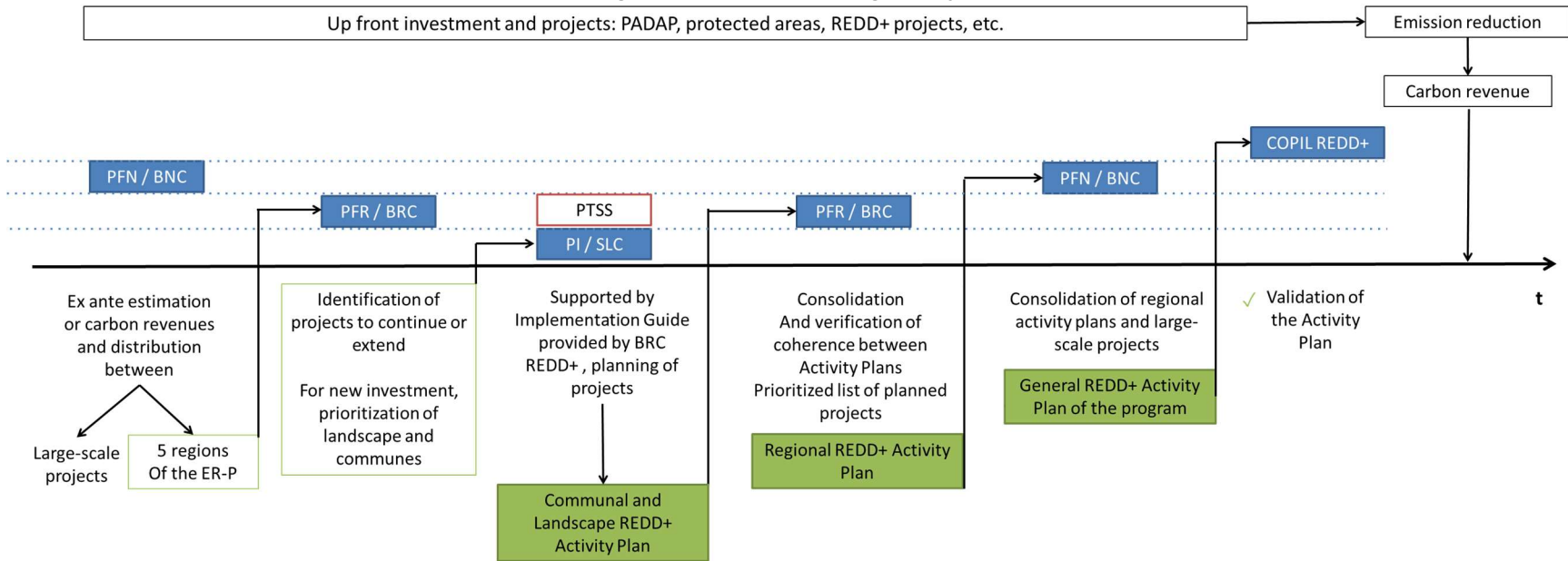


Figure 36: Distribution process when revenues are inferior to ex ante estimation

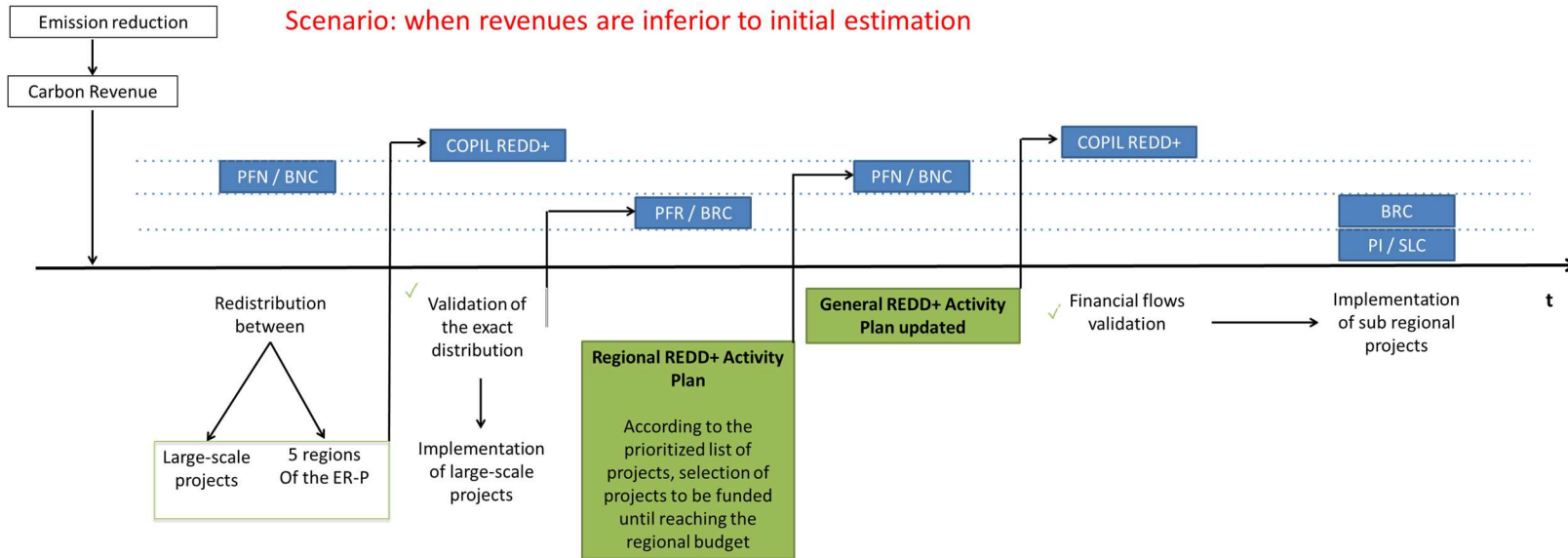
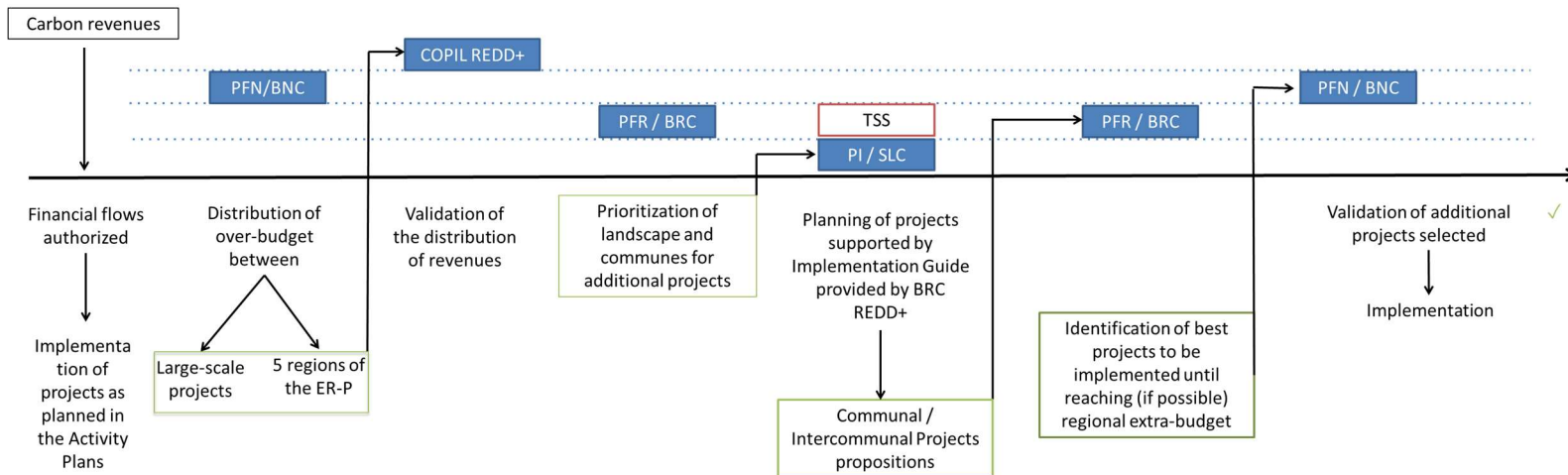


Figure 37: Distribution process when revenues are substantially superior to ex ante estimation

Scenario: when revenues are substantially superior to initial estimation



When carbon revenues are equal or slightly superior to what was expected, then all planned projects will be implemented and extra budget will be set aside as treasury, and potentially made available for investment during the next cycle of carbon revenues generation.

d. Distribution key of benefits among stakeholders, a decision-making tool at national and regional level

In order to adjust investments in performing projects and to ensure the global efficiency of the program by taking into account the diversity of circumstances and needed interventions (see analysis of drivers on section 4.1), the program cannot define a single distribution key for all projects to be implemented.

However, equity is one of the main principles of the benefit sharing arrangement. The program will need to ensure that all stakeholders can benefit. Thus, a distribution tool will be developed and managed at central level by BNC REDD+ for the overall program and at regional level by BRC REDD+ for regional projects only. The aim of these distribution keys is to provide orientation during the planning phase and to encourage rebalancing if disparities arise during a cycle of carbon revenues.

e. Criteria for distribution of carbon revenues

According to the phased approach of project planning and monetary benefit sharing, a list of criteria for prioritization and selection of projects needs to be defined in a way that they will ensure efficiency and equity within the program.

According to the level and type of decision, criteria may change slightly. The following table lists the current criteria that have been discussed with the PFN REDD+. However further consultation and work with PFN REDD+ and PFR REDD+ is already planned in October 2017 in order to bring more detail and to these criteria, particularly to identify more quantitative criteria.

Table 32: Criteria for prioritization of projects and distribution of carbon revenues

Scale of decision	Entity that will decide of the distribution	Distribution between	Criteria
Program Level	PFN REDD+, supported by BNC REDD+ and information provided by activity reports of large-scale projects of the previous cycle	...large-scale projects to be continued, extended or created, and all regions	<p><u>Performance</u>: projects allowing important ERs with low cost due to economy of scale</p> <p><u>Equity</u>: local population are receiving a substantial part of benefits (including non-monetary and non-carbon benefits, to be estimated).</p> <p><u>Perpetuation</u>: local population and main stakeholders of the project are progressively acquiring ownership over the activities ensuring their continuity without being eternally dependent on external funding</p>

Program Level	PFN REDD+, supported by BNC REDD+	<p>.... the 5 regions for the program</p> <p>Between 60% to 70% of the budget should be split between region according to performance criteria, the rest according to equity and environmental criteria</p>	<p><u>Performance</u>: estimated performance through proxy of all sub regional projects of the previous cycle.</p> <p><u>Equity</u>: demography (number of inhabitants) and estimated level of poverty (an indicator needs to be defined with the Ministry of Decentralization and according to available data). Regions with higher population and level of poverty will be prioritized</p> <p><u>Environmental</u>: level of pressure on existing forests (scenario of future deforestation based on historical analysis), and forest cover (in ha), in order to maintain intact forest where the threats are higher.</p>
Regional Level (within each region of the ER-P)	PFR REDD+, supported by BRC REDD+ and information provided by activity report of large-scale projects of the previous cycle as well as the regional distribution key	<p>... projects to continue or to extend, at communal and intercommunal level (landscape).</p>	<p><u>Performance</u>: estimated performance through proxy during the previous cycle</p> <p><u>Efficiency</u>: for continuity of project, some costs has to be deleted or reduced compared to the previous cycle, because of successful ownership and capacity building of local stakeholders and beneficiaries during the previous cycle. For thematic extension (new type of activities within an existing project), a clear rationale will be necessary to demonstrate that the extension will substantially increase ERs with low cost. For geographical extension (same activities but on an extra area of the initial project) will be only based on performance criteria, and only if the performance is proved to be very high.</p> <p><u>Perpetuation</u>: local population and main stakeholders of the project are progressively acquiring ownership over the activities ensuring their continuity and eventual reduced reliance on external funding</p>
Regional Level (within each region of the ER-P)	PFR REDD+, supported by BRC REDD+	<p>... high-priority landscape and communes for new projects</p>	<p>1/ <u>Environmental</u>: level of pressure on existing forests (high deforestation), and forest cover (in ha), including secondary forest</p> <p>2/ <u>Equity</u>: (i) estimated level of poverty based on existing data or expert knowledge of PFR REDD+ members, and(ii) absence of any other green development projects or initiatives in the communes.</p>
Regional Level (within each region of the ER-P)	PFR REDD+, supported by BRC REDD+ and based on received Activity Plans from the different communes (and intercommunal landscape)	<p>This step doesn't aim at distributing revenues but to prioritize in a list the different projects proposed at landscape and communes level within the region</p>	<p><u>Performance</u> estimated in the projects propositions</p> <p><u>Equity</u> as described in the projects propositions</p> <p><u>Perpetuation</u> as justified in the projects propositions</p> <p>Efficiency as justified in the projects propositions</p>

f. *Integration of existing REDD+ pilot projects (CAZ and Makira)*

Hereafter CAZ and Makira will be denominated as “REDD+ pilot projects”, while other projects denominated REDD+ project are those described in section 6 and to be implemented during the reinvestment phase once the first carbon revenues are received at jurisdictional level.

The two REDD+ pilot projects already have their own benefit-sharing mechanisms focusing on the provision of a majority of benefits directly to local communities living around the boundaries of the protected areas. These communities are simultaneously the co-managers of the PAs and the major direct sources of threats, due to their role in *tavy* agricultural activities.

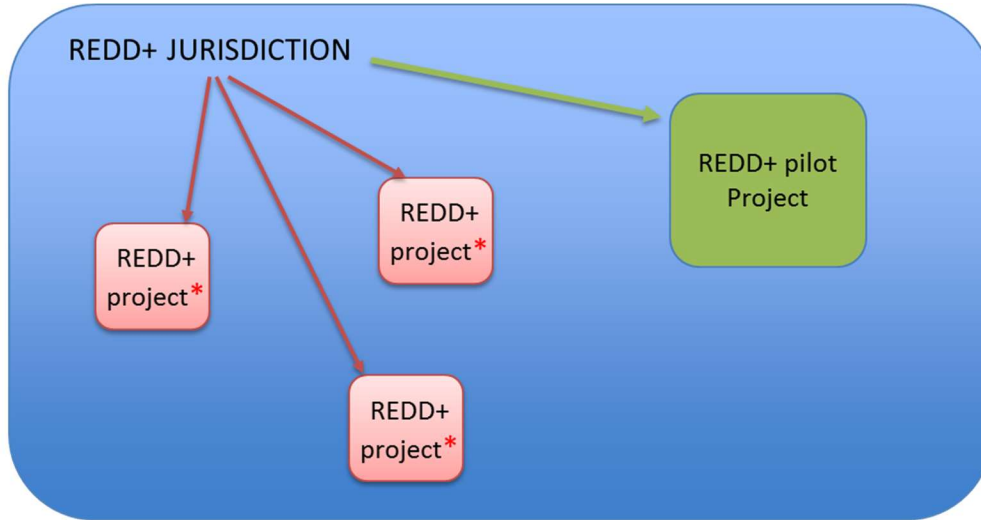
Discussions between the MEEF and the project managers have been ongoing for several months, and it is clear that there is a common interest among all parties to build on the lessons and successes of these projects by integrating them into the jurisdictional program. Some principles of integration have been discussed with WCS and CI. It has been decided that Makira and CAZ will keep their benefit sharing mechanisms as they are, since they are key to the function of the projects, and to maintain the agreements with communities. Therefore, the jurisdiction will distribute to them two types of revenues:

- Monetary revenues (in dollar) after sale of ERs to the Carbon Fund. Funds shared with the projects as a result of their contribution to ER generation will then be distributed to the local stakeholders of these REDD+ pilot projects according to their current benefit sharing mechanism (using a fixed key of benefit sharing);
- If the jurisdiction is generating additional ERs from within these project areas what will be sold to the Carbon Fund, pilot projects might receive some ERs that they will be able to market independently from the ERPA (potentially as VCU's or as Madagascar ER-Program ER's), if agreed beforehand with the GoM and according to specific procedures (that will be developed in the next weeks and months), and then registered in the national REDD+ registry.

Specific agreements under elaboration will be finalized before the end of this year between the GoM and WCS and the GoM and CI in order to confirm the rules that will determine the amount of revenues that each project will contribute to the jurisdiction, both for the specific case of the ERPA with the Carbon Fund, but also extending to additional jurisdiction-level buyers. These formal legal agreements will seek a win-win situation where (i) the jurisdiction will support the continuity and stability of existing REDD+ pilot projects and will receive revenues from their ER generation to support expansion of ERP future activities (ii) while preserving the global performance of the jurisdictional program and balancing the revenues that the REDD+ pilot projects receive (even if they are responsible for the majority of the program performance,) allowing the jurisdiction to reinvest part of these sub-projects performance into new REDD+ projects and activities within the program area (and following the benefit sharing mechanism described below, as well as the institutional arrangements described in section 6). These agreements will also address other issues such as shared costs, reliance of the projects on monitoring and other systems put in place by the ER-P, and technical issues such as reference levels and safeguards processes. The ability of the ERP/GoM to transfer title of ER's from these projects to the Carbon Fund Participants will be made clear in the legal agreements, and high priority will be given to avoiding any issues associated with transfer of title and accounting.

This general principle and concept is described in the following figures.

Figure 38 - Link between REDD+ jurisdiction, REDD+ project and REDD+ pilot project






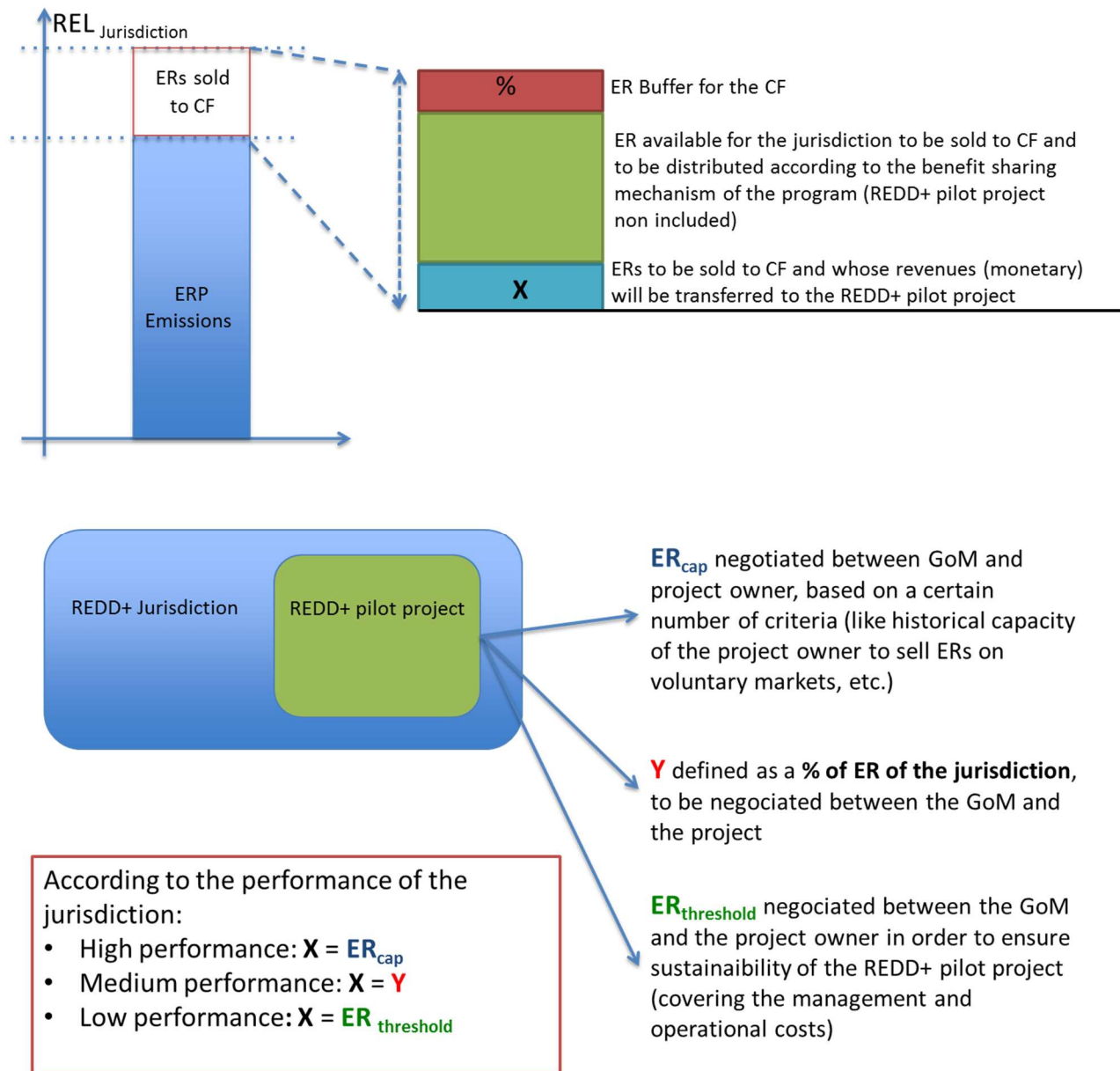
-  Project to be planned and implemented according to the institutional arrangements as described in section 6
-  Investment in REDD+ projects (once validated according to the process of benefit sharing mechanism described above) using payments for results of the previous phase.
-  Transfer of monetary carbon revenues to be transferred to the REDD+ pilot project owner and then distributed to stakeholders according to the benefit sharing mechanism of the REDD+ pilot project.

Figure 39 – General principles and concept of Win-win scenario for benefit sharing between the jurisdiction and REDD+ pilot projects (hypothesis: 100% of ERs are sold to CF)



Current issues and discussions regarding integration of Makira REDD+ pilot project into the jurisdiction

In order for the GoM to be able to directly transfer ER's generated by the Makira project to the World Bank, a legal agreement giving right to transfer of title to the GoM will be formalized, based on the final agreements on benefit sharing. In addition to this legal issue, other aspects of project integration have been intensively discussed and some initial solution have been identified:

- Safeguards: all safeguards plans developed by WCS for Makira Protected Area are already in line with the REDD+ safeguards framework currently under finalization. Makira had developed a set of very precise criteria for environmental and social impact monitoring that are currently being reviewed to ensure that they are fully nested into the PCI REDD+.
- Institutional arrangements of Makira will not change because the REDD+ pilot project will be considered as any other REDD+ project that will be able to propose their own internal and local organisation for their implementation. However, Makira REDD+ project is today based on the

participation of VOIs rather than communes, so in order to ensure coherency with the jurisdiction, the existing steering committee of Makira will be redefined in order to ensure improved participation of concerned communes (and region) into the validation of activities implementation.

- If additional activities are identified by the communes included in the Makira project, activities that would not be realized through the REDD+ project internal planning, and if these activities are not detrimental to the Makira REDD+ project, they will be considered as additional to the Makira REDD+ project and thus they will follow institutional arrangements and benefit sharing mechanism as described in sections 6 and 15.

There are still some pending questions and issues to be clarified in the next weeks and whose solutions will be incorporated into the “agreement” between the GoM and WCS to be finalized by the end of 2017:

- Clarify the legal aspects regarding the capacity of the GoM to transfer ERs to WCS when the ERP implementation begins
- Clarify technical aspects regarding the nesting approach for the reference levels, and the capacity of WCS to potentially continue to sell VCU on voluntary market.

BNCR recognizes that these aspects are highly critical for the program, thus they have been identified as the priorities for the next three months and all parties are focused on delivering a solution by the end of 2017. Fortunately the current discussions and workshops between WCS and BNC REDD+ have shown that a real willingness exists between the two parties to establish a “win-win situation” as described in the introduction of this section.

Current issues and discussion regarding integration of CAZ REDD+ pilot project into the jurisdiction

Issues related to the integration of the CAZ project are expected to be similar in kind to those identified above for Makira. As with Makira, these issues have been prioritized, and all parties are committed to finding a legally valid and transparent agreement which respects the principles of REDD+, the goals of the ERP, and the structure and agreements existing in the project. In addition to the project-program issues discussed, the CAZ project is also a grantee of GCF funding, with implications for ER’s generated by the project, as described below:

On 26 November 2015 Madagascar entered into a Letter of Intent (“the Lol”) with the World Bank regarding the potential purchase of emissions reductions from its ER-P in the Eastern Forest of Madagascar.

The Sustainable Landscapes in Eastern Madagascar (SLEM) project was submitted to the GCF in September 2016 and approved by the GCF Board at its fourteenth meeting on 12-14 October 2016, subject to a number of conditions. The project is managed by Conservation International Foundation (CI), and the European Investment Bank (EIB), together known as the “Accredited Entities”. CI also serves as one of the project’s “Executing Entities”, together with the Malagasy National Climate Change Coordination Office (“BNCCC”, in its French acronym) and the Althelia Climate Fund (“Althelia”).

The objective of the SLEM project is to “implement sustainable landscape measures to enhance resiliency of smallholders, reduce GHG emissions and channel private finance into climate-smart investments in agriculture and renewable energy”. It consists of three principal components:

1. **Public sector, grant-funded activities.** This component, which is grant-funded and implemented by CI as executing agency, is largely focused on mitigation and adaptation through sustainable agriculture and improved forest management, with relatively smaller components on improved climate risk awareness and adaptation measures and institutional capacity building.
2. **Creation of an Investment Fund.** This component, mostly funded through equity and loan finance and with significant co-finance from EIB, will focus on replicable and scalable for-profit investment in sustainable agriculture and renewable energy activities. The fund will be managed by Althelia.
3. **Initial capitalization of a National Climate Change Trust Fund.** This Fund will be initially funded through the project, with the aim of continuing investing in mitigation and adaptation outcomes after the project's lifetime.

With the exception of the institutional capacity building activities, the first component will primarily focus on two specific geographies in Madagascar: the Ambositra Vondrozo Forest Corridor (known by its French abbreviation, COFAV) and the Ankeniheny-Zahamena Forest Corridor (known as CAZ). The Investment Fund may also operate in these geographies, but will also make investments in other areas of Madagascar. Together, these activities are expected to generate some 10 MtCO₂e in emissions reductions, as well as a range of other non-carbon benefits. The project duration is 10 years, and was initially planned to begin on 1 January 2017; however, the first component is expected to be implemented in the first five years. The actual project start date is pending the completion of legal arrangements with the GCF.

The first component of the SLEM project includes support for activities already underway as part of two VCS projects, including one project that falls within the ER-P Accounting Area: the 'Carbon Emissions Reduction Project in the Corridor Ankeniheny-Zahamena (CAZ) Protected Area, Madagascar' (the "CAZ VCS Project"). The CAZ VCS project was registered in April 2014 by the Government of Madagascar as project proponent and Conservation International as its Authorized Representative. It has already generated and verified over 4.3 million tCO₂e of emissions reductions relating to the period 31 Dec 2007 – 31 Dec 2011.

As can be seen from the above overviews, the ER-P and the SLEM project partially overlap in terms of location, activities and duration.

1. **Location.** The CAZ corridor falls completely within the ER-P accounting area and is a key focus geography of the SLEM project. The other focus geography (COFAV) on the other hand does not fall within the ER-P accounting area. Investments made by the Investment Fund may also fall within the ER-P accounting area.
2. **Activities.** The grant-funded activities as well as the Investment Fund initiatives foresee the reduction of GHG emissions through the implementation of sustainable agriculture and improved forest management, the Investment Fund also foresees the development of renewable energy to replace the use of biomass. Moreover, both components foresee supporting the implementation of the activities that form part of the CAZ VCS project.
3. **Duration.** Although the accounting period of the ER-P may change and the SLEM project implementation date is not yet determined, it can be expected that the SLEM project will continue for the duration of the five-year accounting period foreseen for the ER-P, although the public-sector activities may end one year or so before the end of the accounting period.

The existence of this overlap raises two potential risks, specifically relating to multiple claims over emissions reductions generated by the respective initiatives, and potential instances of double finance.

The GoM, CI, and Althelia have been in discussions to clarify and resolve any potential issues regarding integration of the CAZ project into the ER-Program. One potential solution is currently being discussed and analyzed, and will be presented formally once all analyses are complete and all parties have agreed to

move forward. The aim of all parties is to agree and publicly present a concrete solution that meets all technical requirements to avoid multiple claims to emissions reductions or double finance of activities before the ER-PD is presented in December 2017.

15.2. SUMMARY OF THE PROCESS OF DESIGNING THE BENEFIT-SHARING ARRANGEMENTS

The development of institutional, operational and financial arrangements of the ER-P, and more precisely of the benefit-sharing mechanism, have been the core discussions and reflections of the PFN REDD+ since its creation. It has also been discussed in each PFR REDD+ of the program.

These benefits sharing arrangements are also the results of the different consultations realized in the studies that supported and fed into the development of the program (see section 5). It is worth noting that during the multiple consultations on the REDD+ and ER-P the general principles of a benefit-sharing mechanism in the context of the ER-P were discussed and feedback was incorporated into the design that was formalized with the PFN REDD+ and PFR REDD+.

In parallel, and in order to include an independent check, a study was launched in March 2017 in order to analyse the different options for a benefit sharing mechanism for the program, with consultations realized in 3 watersheds of the programs: Andapa, Soenierana-Ivongo and Iazafo.

Finally, what has been presented in section 15.1 corresponds exactly to the last state of discussion and agreement between PFN REDD+ and PFR REDD+, and incorporating first inputs from the “independent” study.

The next fundamental steps of development are:

- Define in details all procedures and develop some preliminary draft of guides for stakeholders;
- Define the criteria, per level of implementation, of prioritization and evaluation of projects;
- Clarify the integration of REDD+ pilot projects

15.3. DESCRIPTION OF THE LEGAL CONTEXT OF THE BENEFIT-SHARING ARRANGEMENTS

This section refers to sections 4.4 and 4.5 and legal existence of the different entities of the program are already presented in section 6.1, except for the SLC which is the main concertation body in charge of planning projects at local level (communal and intercommunal), making it the core instance of the overall benefit-sharing mechanism at sub regional level.

The implementation of such structure is regulated with the decree N°2105-957 that fixes applications modalities of the organic law N°2014-018 of the 12 September 2014 that describes skills organization modalities and functioning of CTD.

Created through a specific decree, each SLC is gathering representatives from the communal executive and the entity in charge of the community, of STDs, private operators, civil society organizations, traditional leaders, local political party and organizations, women /children / vulnerable population associations. Its operating costs are supported by the commune, but membership is free.

Its mission is to advise and foster “an emerging shared vision of development and formulate new propositions, to put in coherence all interventions and share resources, to identify and valorise territorial opportunities, to seek for partnerships, to manage a participative budget (FDL), to elaborate and update Local Development Plan (PDL) and to ensure decentralization and intercommunal cooperation.

16. NON-CARBON BENEFITS

16.1. OVERVIEW OF POTENTIAL NON-CARBON BENEFITS AND IDENTIFICATION OF PRIORITY NON-CARBON BENEFITS

This Section analyzes the associated non-carbon-benefits generated for each activity proposed in section 4.3. This analysis was performed for the ER-PIN submission and is being refined for the ER-PD. Further consultations with stakeholders are being conducted but are not yet finalized. Non-carbon benefits will vary depending on the specific activity undertaken. As specific activities will be identified and prioritized by the communities who will participate in and be impacted by them, the prioritization of individual non-carbon benefits will take place at a more local level than the jurisdiction as a whole. Thus, while the benefits described below indicate the range of non-carbon benefits that the program as a whole seeks to generate, prioritization of these benefits will only be realized as local and regional-scale activities are identified and planned.

Non-carbon benefits from activities within the agriculture sector

It is through improvements to agriculture that the co-benefits will be the most significant. The development of new agricultural practices (intensification and diversification of production, activity AD1), accompanied by the practice of agroforestry (activity AD2) will increase the productivity plots, preserve and increase the productivity of soil and reduce the cost of infrastructure maintenance. This overall improvement will allow households to achieve greater food stability and dispose of surplus that they will be able to sell to supplement their income, a situation that will also be fostered through the activity AI1 (market access improvement through value chain creation and integration). This co-benefit will allow households to move out of a subsistence mode and benefit from greater food security together with a small additional income. Agriculture related activities would also have a positive impact on health by diversifying the food supply.

Non-carbon benefits from activities within the forestry sector

Restoration, afforestation and reforestation will have a positive impact on the local climate regulation through carbon storage, and reducing the risk of local drought with negative impacts on rice crops (activity FD2). Moreover, water regulation, which is at the heart of this sector, will also be better managed thanks to the new arrangements and planning put in place (activity FD1); the structure of soils and all fauna and flora will be also better conserved due to new, more environmentally friendly practices.

As for the agriculture sector, and thanks to activity FI2 and in some extent FD1, the forestry sector activities of the program will participate in local development, not only through a better controlled and

sustainable timber production but also with NTFP and biodiversity and specific value chain creation, reducing the dependency of local population on their “survival” mode of living.

Non-carbon benefits from activities within the energy sector

The development of new forms of energy and improved yields related to the use of wood energy should reduce emissions of CO₂ from deforestation, improve the well-being of populations, but also change their behavior with regard to the use of energy resources. Finally, it is important to note that the sectors linked to the exploitation of forest resources will contribute to land tenure security and a better supply to the market.

A key co-benefit of this program is the securing of forest energy resources, allowing the progressive phasing out of the degradation and deforestation process typically associated with the practice of collecting wood fuel. Once implemented, the emissions reduction program will allow households to access new wood thanks to a new management plan, thereby sustaining the resource at the same time as commercializing it.

Non-carbon benefits from intersectoral activities or within other sectors

A significant number of benefits of the “intersectoral activities” of the program are socio-economic and environmental. The plans of the sustainable management of soils will have an anti-erosion effect protecting more effectively the soil and the biodiversity (activity ID1). The new governance policy and the strengthening of sectorial policies will foster the creation of new 'non-land' jobs, new markets by supporting the economy as well as securing the land tenure to avoid poor utilization of forest resources (activity II2, II3 and II4 in parallel).

Finally, the program will generate benefits for biodiversity. The existing REDD+ projects in Madagascar have started from a principle of forest preservation and the consequent avoided deforestation. They therefore have biodiversity conservation at the heart of their purpose. The present ER program is also placing a focus on the reconstitution of degraded forestlands, lands from which the forest and its biodiversity have been lost. But the rationale, from the standpoint of the biodiversity co-benefits, is that the reconstitution of these degraded lands will permit both the protection of existing forest and the expansion of forest, and the consequent re-connection of more recently isolated forest fragments. While the quality of such forest (in terms of species richness) may initially be low, it will constitute a process of gradual restoration of forests, which will have undoubted biodiversity benefits, that are highly critical in such a country with exceptionally high levels of endemism, both of plant and animal species.

To prioritize non-carbon benefits, a transversal vision is necessary because most of non-carbon benefits are not specific to each sector. Two main objectives drive prioritization of projects within the program.

i. Conservation and improvement of environmental services:

- Improved conservation and strengthening of protected areas: the program should improve habitat conservation for biodiversity as well as support reforestation and natural regeneration of degraded and secondary forest that will also protect biodiversity and play a role in maintaining soil and fertility.
- Increased knowledge and valorization of environmental services at all level: the program will demonstrate that forests are closely linked to livelihoods and well-being: better quality and supply of water as well as increased maintenance of soil fertility and sustainability of agriculture, and other increased economic opportunities (agroforestry with value production, but also Non-Timber Forests Products and eco-tourism).

ii. Improvement of population well-being:

- Diminution of poverty and unemployment: the program should generate additional and diversified incomes for households and private sector as well as foster value production. The program will promote agroforestry in order to increase profitability of local population to work in degraded or secondary forest (with high risk of deforestation without such initiatives) independently from carbon revenues (food crops based on improved varieties in combination with wood energy, timber or NTFP) but generating alternative revenues and diverting workforce from *tavy*.
- Increased access to markets, health system and education: the program should provide collective socio-economic investments in the form of rewards to local communities as a result of their efforts and performance in deforestation reduction (e.g. roads, bridges, and transformation facilities to facilitate economic development, stable prices and access to markets, but also local hospital facilities or schools).

So far priority non-carbon benefits have been identified by BNC-REDD+ and based on the different consultations with stakeholders realized in diverse studies and workshops organized. Specific workshops will be organized with PFN REDD+ and PFR REDD+ in order to validate the priority non-carbon benefits at the scale of activity planning.

However, and to be in line with the general strategy of the program, non-carbon benefits, as with other program benefits, must be in line with the ER-Program main objectives: maintaining biodiversity and contributing to reduction of poverty.

Biodiversity is maintained and ecosystems services are improved

The program strategy seeks to maintain existing forest cover and increase regeneration of fallow land.

The program will support conservation by strengthening existing protected areas, and supporting the development of community conservation areas. This strategy will impact biodiversity by providing habitats for animals. Reforestation and natural regeneration of fallow land will also foster vegetal biodiversity and play a role in maintaining soil fertility.

Biodiversity co-benefits of this program will thus be shared among all type of stakeholders: increasing maintenance of soil fertility and sustainability of agriculture, increasing economic opportunities such as Non-Timber Forests Products and eco-tourism.

Local livelihoods and the well being of stakeholders are improved in the long-term, with a focus on the most vulnerable groups

The program aims at generating additional and diversified incomes for households and private sector as well as fostering investments. Generating additional income from higher yields and diversification of the sources of agricultural revenues is at the heart of the strategy of the program. It is expected that non-carbon benefits in some cases could take over carbon revenues as incentives to maintain low carbon development options. The program is designed as a catalyst for economic activities where carbon revenues are used as an investment lever for the private sector and local stakeholders including vulnerable people.

Also, once each REDD+ project of the program will be realized, the “reward” system will fund investments in social and collective infrastructure such as bridges, agricultural transformation facilities, schools, local clinic, local market, etc, according to the priorities of the communities participating in and impacted by the activities

16.2. APPROACH TO PROVIDE INFORMATION ON PRIORITY NON-CARBON BENEFITS

This subsection has been discussed in Subsection 14.2 when describing the SIS, because non-carbon benefits are part of the PCI-REDD+ used in Madagascar (see annex V). However, some indicators need to be added in the PCI-REDD+ list, and other more detailed, in order to totally be in line with the vision of the ER-P on non-carbon benefits as described just above.

For each of the two-priority non-carbon benefit, one criterion has been identified in order to easily monitor and evaluate that the program reaches its objectives:

- Presence or increase in lemur population within forest adjacent or included to the REDD+ project. Lemurs species are a good indicator of environmental integrity of ecosystems and some species can only be seen in forest that can still ensure their ecological functions. Also, the presence of lemurs is important for tourism and is correlated to the objective of the program to create alternative sources of revenues for local population, including through ecotourism promotion.
- Number of social infrastructure projects established and enabling a substantial improvement of local livelihoods. Through the different activities of the program as well as the reward system of each REDD+ project, investment for social infrastructures will be linked to environmental stewardship in order to incentivize local people to act for the reduction of deforestation and also commit to the overall objectives of the program.

Both indicators will be integrated into the SIS. The specific procedures and methodology to evaluate these criteria will be developed with stakeholders (after agreeing on the nature of these indicators) in the coming weeks.

17. EMISSION REDUCTIONS CERTIFICATES

17.1. ER PROGRAM AUTHORIZATION

Table XX. ER-Program Authorization

Name of Entity	Ministry of Environment, Ecology and Forests
Signing Representative	Madame NDAHIMANANJARA Bénédicte Johanita
Function	Minister of Environment, Ecology and Forests
Address	...
Telephone	...
Email	...
Reference to the decrees, laws or other types of decisions identified by this national authority within the ER-Program.	<ul style="list-style-type: none">• Decree No 2016-298 on the responsibilities of the Ministry of Environment, Ecology and Forestry and the general organization of the Ministry;• Decree No 2013-785 laying out the modalities for the delegation of state forests for public or private entities;• Code civil of Madagascar;

The Government of the Republic of Madagascar will negotiate and sign the ERPA, represented by the Ministry of Finance and Budget (MFB) Ministry of Environment, Ecology and Forestry (MEEF).

The responsibility of the MFB flows from Decree n ° 2007-187 of 27 February 2007 modified by Decree n ° 2008-106 of 18 January 2008 and n ° 2008-1152 of 11 December 2008 setting out the powers of the Minister of Finance and Budget and the general organization of its Ministry".

The responsibility of MEEF flows from Decree No 2016-298 on the responsibilities of the Ministry of Environment, Ecology and Forestry and the general organization of the Ministry which mandates MEEF to "reduce the process of degradation of natural resources" and to "provide for the rational and transparent valorization" (Article 1).

17.2. TRANSFER OF EMISSION REDUCTION CERTIFICATES

MEEF has the authority to transfer title to the emission reductions to the Carbon Fund. Such transfer will be in line with the land tenure and resource tenure rights of communities and other right holders, namely small holder farmers.

For state forest land – the program zone does not include private forests or forests delegated to decentralized government entities (CTD) – carbon title is defined as belonging to the state by law (provided for in Decree No 2013-785 laying out the modalities for the delegation of state forests for public or private entities, see section 4.4 above). This statutory allocation of right does not, however, apply to forests managed under GELOSE or GCF, in which the authorized local communities (V.O.I.) hold the primary rights to resource valorization, which appears to extend to valorization based on forest emissions trading.

For non-forest land (about 30% of the program zone), carbon title is created in accordance with principles of private law as defined in Madagascar's Code civil. REDD+ emission reductions represent a service which gives all its providers and contributors a claim to the proceeds. Such claim may be satisfied (rewarded) by means of carbon benefits and non-carbon benefits.

To allow for a structured process of engagement and reward, while securing that at all times the title to the relevant emission reductions is validly transferred under the ERPA and that such transfer is done in a transparent way, including with the acknowledgement and approval of all providers/contributors, it is suggested to install a contractual mechanism applicable to emission reductions from non-forest land as well as from forest land under V.O.I. management (GELOSE/GCF).

Under this mechanism, the terms for participation in the ER Program will be set out including the details of REDD+ valorization, as provided in the Benefit Sharing Mechanism. The terms shall also include a commitment of exclusivity, i.e. the provider/contributor commits not to participate in another GHG valorization program for the same activities and the same results as obtained by this program.

The implementation of the mechanism will follow the implementation of the ER Program (see section 6.1 and 15.2). For the first phase (covering the first two years), the ER Program activities will be financed from existing programs and bodies, namely PADAP, CAZ, Makira, MNP. As the intervention areas for CAZ, Makira and MNP are governed by Decree No 2013-785, carbon title will a priori be with the state. The PADAP intervention, however, targets both forest communities (including GELOSE/GCF) and small-scale farmers, for which the original title to emission reductions needs to be ascertained using the principles of Madagascar's private law (as provided by the Code civil).

Where the effect from the PADAP intervention on the communities and farmers is indirect (e.g. the intervention finances the improvement of an irrigation system or capacity-building), the communities and/or farmers cannot be deemed provider/contributor to the REDD+ service. If anything, the PADAP proponent will have provided this part of the REDD+ service.

By contrast, where the effect from the PADAP intervention on the communities or farmers is direct and individualized (e.g. when communities or farmers are asked to switch to a different agricultural practice), the contractual mechanism will kick in. The terms of ER program participation and reward, in this case, should be clearly spelled out in a statement of affiliation, which may come in the form of a contract proper, a Memorandum of Understanding (MoU) or – relevant, above all, for communities – any appropriate expression of collective governance (e.g. a resolution in accordance with the applicable governance roles). The language used in such a statement of affiliation may change from case to case, as long as the fundamentals are addressed. Model terms could run as follows:

Clause X.X. The present intervention is a measure affiliated with both the Sustainable Agriculture in a Landscape Approach (PADAP) and the Emission Reduction Program ("ER Program"). The [community] [farmer] was represented / present at [workshop A] at which the details of PADAP and the ER Program, including the ER Program Benefit Sharing Plan were discussed.

Clause X.Y. The [community] [farmer] acknowledges and agrees that this intervention becomes an integral part of the Program, and it acknowledges and agrees the details of the Benefit Sharing Plan as published.

Clause X.Z. The [community] [farmer] takes best efforts to implement the intervention. It hereby agrees not to allow the greenhouse gas emission reductions (“GHG ERs”), achieved as a result of the Program, to be used in any other similar program or activity aimed at generating GHG ERs. It also agrees that the Program operator is deemed the generator of GHG ERs and that the proceeds of their commercialization shall be distributed according to the Benefit Sharing Plan.

The same approach will be used, when the ER Program enters its second phase, in which new activities and/or areas will be included in the intervention scope. Just as before, where the intervention effects remain indirect, the contractual mechanism does not come into play. By contrast, where the communities (including V.O.I. under GELOSE/GCF management) or individual farmers make an active contribution, the contractual mechanism will be operationalized as discussed above.

For each program extension (by activity or zone), the institutional actors – PFR REDD+, BRC REDD+ and the Local Concertation Structures (“SLC” as established by Decree 2015-957, see section 15.3) – will draw up a list of direct participants and will propose the appropriate instruments for implementation (contract, MoU, community resolution or other).

While not required by law, MEEF could decide to apply the contractual mechanism approach harmoniously across the ER Program zone, including concerning communities in protected areas (legally governed by Decree No 2013-785, thus without title to emission reductions and, legally speaking, to any form of reward). This could increase transparency and equity and would have the added benefit of individualizing the ER Program further and make the benefit sharing arrangements known across stakeholders.

18. DATA MANAGEMENT AND REGISTRY SYSTEMS

18.1. PARTICIPATION UNDER OTHER GHG INITIATIVES

Both REDD+ project Makira and CAZ have been presented in section 4.1.C.

These REDD+ projects are dedicated to conservation of protected areas of intact humid forests and provide direct incentives and alternative livelihood activities for communities living around the forest conservation areas. Both projects are registered with Verified Carbon Standard (VCS).

Both projects are willing to integrate the ER-P.

No other GHG initiatives are registered within the jurisdiction.

18.2. DATA MANAGEMENT AND REGISTRY SYSTEMS TO AVOID MULTIPLE CLAIMS TO ERS

a. *REDD+ Program and Projects Data Management System*

Madagascar has decided to maintain its own national REDD+ Program and Projects Data Management System as required by Indicator 37.1 of the CF MF. According to its decree of creation, BNC REDD+ will be responsible for the management of a national REDD+ Registry, which will be developed until the end 2018. Currently the World Resource Institute is developing a forest information system that will be hosted in the Geomatics Laboratory located in BNC REDD+ office's. The current view is that the REDD+ data management system will be integrated in the forest information system platform, in order to take advantage of the synergies with the WRI project and ensure sustainability. This system will be connected to the National Carbon Registry that BNC CC is currently developing. This registry is a database that includes information on climate change mitigation projects and programs developed in Madagascar, that enables Madagascar to report to the UNFCCC. A scheme of this preliminary idea is provided below.

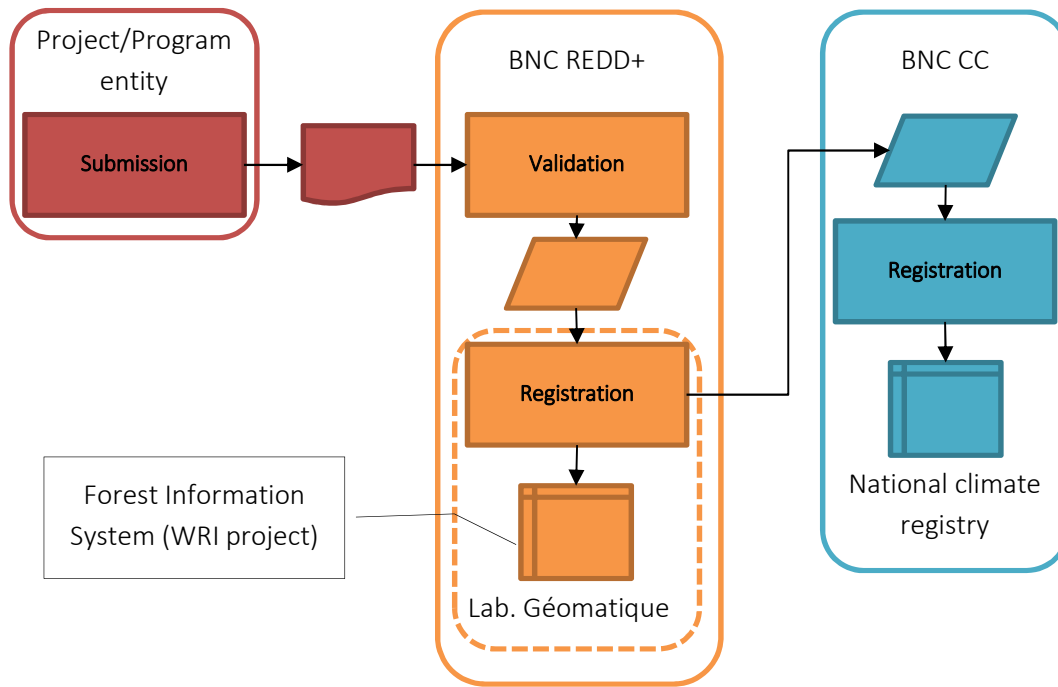


Figure 40. Current view of the information flow of the REDD+ program and project data management system.

Although the details have to be defined yet, it is expected that this REDD+ registry will serve as a data management system and will register all REDD+ programs projects and jurisdictional programs at national level and provide information (or a link conducting to information) such as:

- Entities who own the ERs titles;
- Mechanism (VCS / Gold Standard/ etc);
- ID Number and Project Name;
- Geographic boundaries (with a shapefile available for upload) and surface;
- Carbon pools considered;
- Sources (deforestation, degradation, carbon stock enhancement, conservation, sustainable management of forest);
- GHG considered;
- Reference level (when available);
- ERs estimation;
- Carbon credit issuance estimation;
- Description of main objectives and activities;
- Starting date;
- Monitoring report on activities, safeguards plans and PCI evaluation.

This registry will be closely linked to the SIS which has a web portal under development and that will provide information on safeguards for each project. Compliance with safeguards requirements will be a condition for projects to be registered or issue any Emission Reductions. Yet, these are aspects that are still in early stages of development.

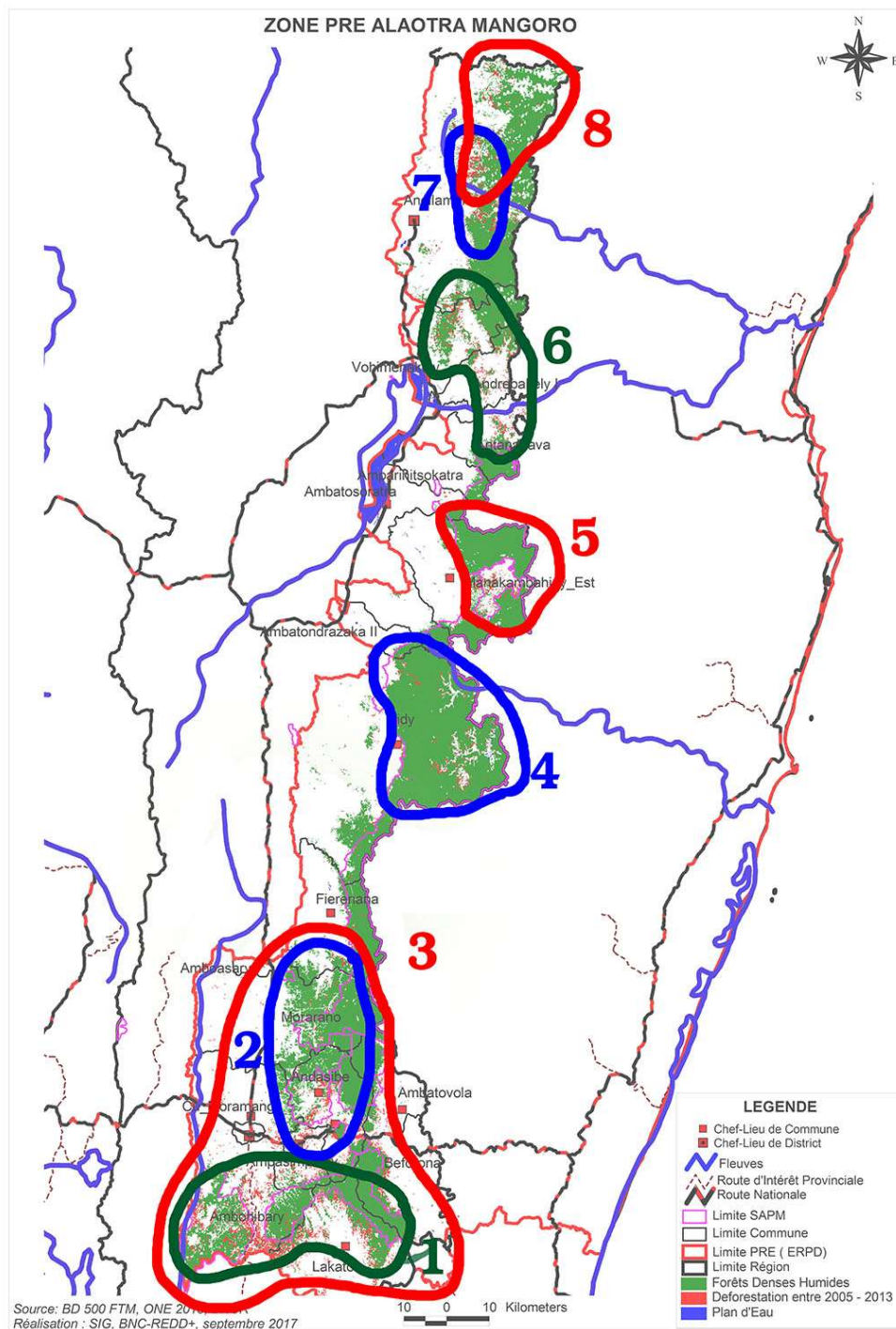
b. *ER transaction registry*

BNC CC is commencing the development of the National Carbon Registry, which it is expected to be a tracking database rather than a registry as such, but it is being analyzed whether it could include functions of transaction registry. However, this will depend on the number of transfers that are expected which is linked to whether the existing REDD+ projects will want to keep direct crediting. Madagascar, is also awaiting the development of the Carbon Fund registry to take a decision on whether to maintain a national ER transaction registry.

However, the development of such registry (data management system and transaction registry) require time and a strong expertise. The GoM of Madagascar is seeking to implement the REDD+ program as early as possible because of the intense preparation phase and strong expectations of all stakeholders. Thus, Madagascar is currently exploring the possibility to use an existing and external registry service during the first years of the program, so that the development of a National Registry would not be a limitation for the implementation of the program and REDD+ in the next years, considering the urgency to reduce deforestation in Madagascar.

ANNEX I - REGIONAL SPATIALIZATION OF PRIORITY ACTIVITIES (ADDITIONAL TO UP-FRONT INVESTMENT) FOR THE ERPA

Region Alaotra Mangoro

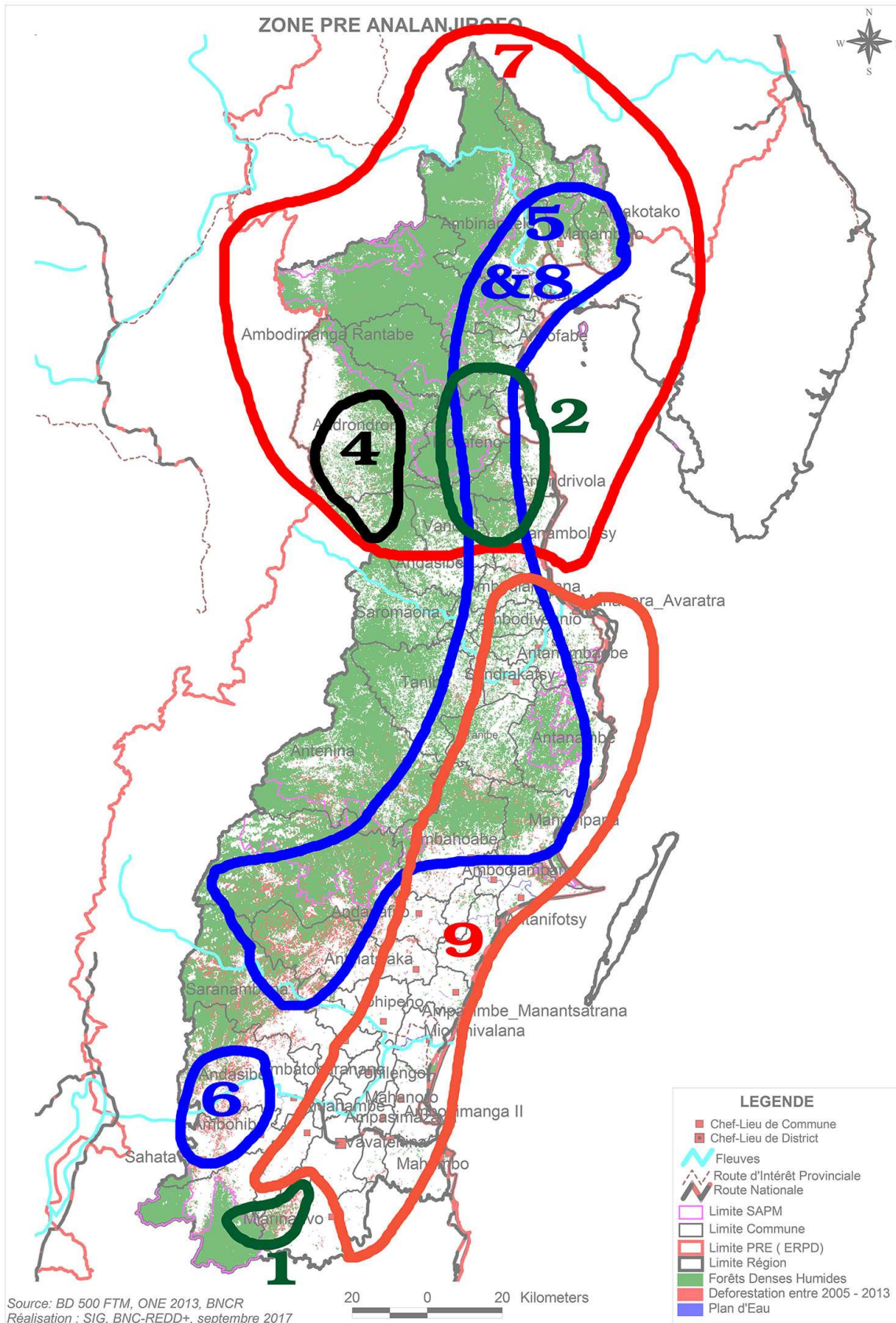


Area on the map	Sector	Causes of D&D	Specific location (communes)	Priority Activities	Beneficiaries
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1	Agriculture	Tavy for annual and perennial crops	Lakato, Ambohibary, Andasibe, Ampasimpotsy, Beforona, Ambatovola	Local stakeholders need to identify the adapted mix of AD1, AD2 and II-1	Farmers and cooperatives, Land tenure offices administration
2	Energy	Charcoal: Both illegal and legal exploitations	Morarano, Andasibe, Ampasimpotsy	Local stakeholders need to identify the adapted mix of ED1, ED2 (low and regulatory text application) and II-1	Local rural and close urban population. Coal producers, Land tenure offices administration
3	Forest	Lumber production: Both illegal and legal exploitations	Lacto, Ambohibary, Andasibe, Ampasimpotsy, Ambatovola, Beforona, Morarano, Fierenana, Amboasary	Local stakeholders need to identify the adapted mix of FD1 FD2 and II-1	Local people, private sector (logging), VOI, CTD, STD, Land tenure offices administration
	Foret	Lumber production: Lack of clarity on rights of use	Lakato, Ambohibary, Andasibe, Ampasimpotsy, Ambatovola, Beforona, Morarano, Fierenana, Amboasary	Local stakeholders need to identify the adapted mix of FD1 FD2 and II-1	Local people, private sector (logging), VOI, CTD, STD, Land tenure offices administration
4	Mines	Small scale and artisanal mining	Didy	II-2	Mining administration, CTD, local population
	Energy	Charcoal: Both illegal and legal exploitations	Didy	Mix of ED1 and ED2	Civil Society, PTF, CTD, STD, local population
	Forest	Lumber production: Both illegal and legal exploitations	Didy	Mix of FD1 and FD2	Local population, private sector VOI, logging association, land tenure offices administration
	Agriculture	Destruction of natural regeneration of forest (fallow lands) by livestock	Didy	AD1	Farmers with livestock
5	Agriculture	Tavy for annual crops associated with and livestock	Manakambahiny Est	Mix of AD1 and AD2	Farmers, VOI, land tenure offices administration
	Forest	Lumber production : Both illegal and legal exploitations	Manakambahiny Est	Mix of FD1, FD2	Local population, private sector, VOI

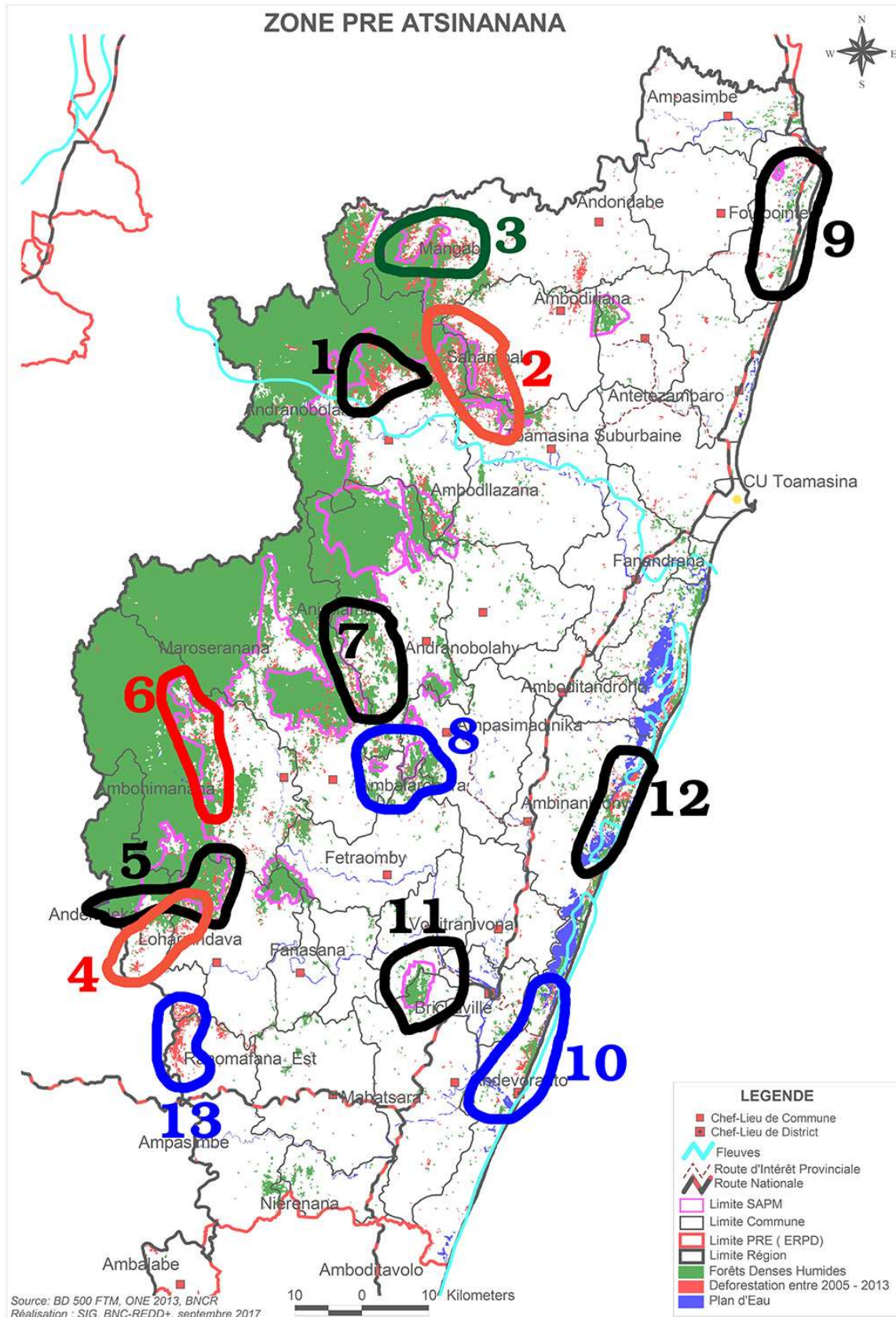
6	Agriculture	Tavy for annual crops associated with and livestock	Antanandava, Andrebakely, Vohimenakely	Mix of AD1 and AD2	Farmers and cooperatives, VOI
	Mines	Gold (small scale and) artisanal mining	Antanandava, Andrebakely, Vohimenakely	II-2	Mining administration, CTD, local population
7	Forest	Lumber production : Both illegal and legal exploitations	Andilamena	Mix of FD1, FD	Local population, private sector, VOI
	Mines	Illegal ruby mining	Andilamena	II-2	Local administration, CTD, population
8	Other	Wild fires in inhabited areas (transhumance for cattle theft)	Nord d'Andilamena	Mix of FD1, FD2, FD3 and FD4	Local population, private sector, VOI

Region Analanjirofo



Zone on the map	Sector	Causes of D&D	Suggestion of activities	Beneficiaries
1 to 6	Mine	Artisanal mining, poverty, non-application and knowledge of the law	II - 2: ensure the application of the law and expulse operators from Protected areas; Support decentralized management of mines	Protected areas and local famers, mining operators, CTD and STD
2 et 3	Mine	Cristal mining, poverty, non-application and knowledge of the law		
Evrywhere	Agriculture	Tavy for perennial and annual crops, poverty, absence of land tenure management	AD - 1, implementation of agriculture infrastructures to improve valorization of low lands through improved practices	Farmers and cooperatives
7 (Mananara North)	Agriculture	Cash crops (vanilla), fluctuation of the price of vanilla; Lack of land tenure management.	AD2: Renewal and extension of cash crops plantations but by implementing Dinamparitra for sustainability	Producers, economic operators, CTD
7 (South Mananara)	Agriculture	Cloves production, lack of land tenure management, corruption		
8	Forest	Selective and illegal exploitation of precious wood (for both national and international markets), corruption	FI 1 to improve local capacity of Ministry of justice and public security in order to stop illegal logging in Protected areas FD1, improve implementation of Koloala, reinforce intercommunity in the control of forest products, and renew the concept of Polisin'ala to reduce illegal logging	Loggers, CTD and STD
9 (Mananara Soanerana Ivongo)	Agriculture	Cash crops: traditional extraction of essential oils and intensification of the activity (increase of the number of local operators)	AI 1: all activity, but a focus on reforestation with fast growing species in surrounding areas of villages and old tavy is a priority ED1: ensure supply of local transformation and alambic unit with sustainable charcoal	Producers, economic operators, CTD

Region Atsinanana

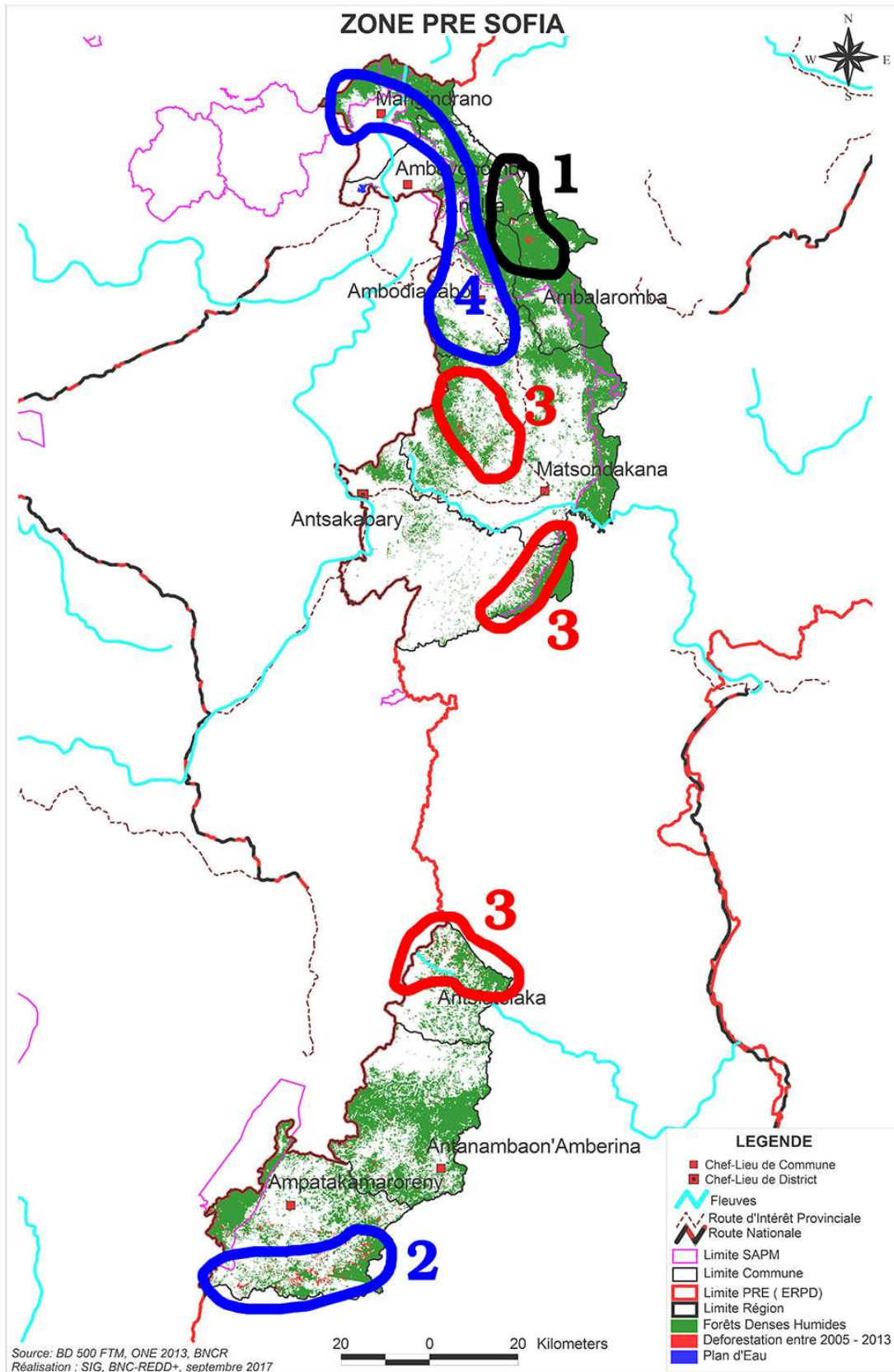


Area on the map	Sector	Causes of D&D	Detailed location	Suggestion of activities	Beneficiaries
1	Agriculture	Tavy	Andranobolahy	AD1 & AD2	Farmers and cooperatives, households
	Forest	Illegal logging due to lack of knowledge of VOI on administrative authorization process		FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
	Mine	Graphite exploitation		II - 2	Artisanal mine operators, local mine administration and STD
2	Agriculture	Tavy (tradition and reinforce by migration flux)	Sahambala	AD1 & AD2	Farmers and cooperatives with traditional practices, households
	Mine	Gold illegal mining		II - 2	Migrants, Artisanal mine operators, local mine administration and STD
3	Agriculture	Tavy	Mangabe	AD1 & AD2	Farmers and cooperatives with traditional practices, households
	Forest	Illegal logging		FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
4	Mine	Gold illegal mining	Lohariandava	II - 2	Migrants, Artisanal mine operators, local mine administration and STD
	Mine	Sapphire illegal mining	Manaraka lalambato		
	Forest	Illegal logging		FD2, FD1, Suivi-Contrôle, Valorisation PNFL	VOI and loggers
5	Mine	Gold illegal mining	Andekaleka	II - 2	Migrants, Artisanal mine operators, local mine administration and STD
	Forest	Illegal logging		FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers

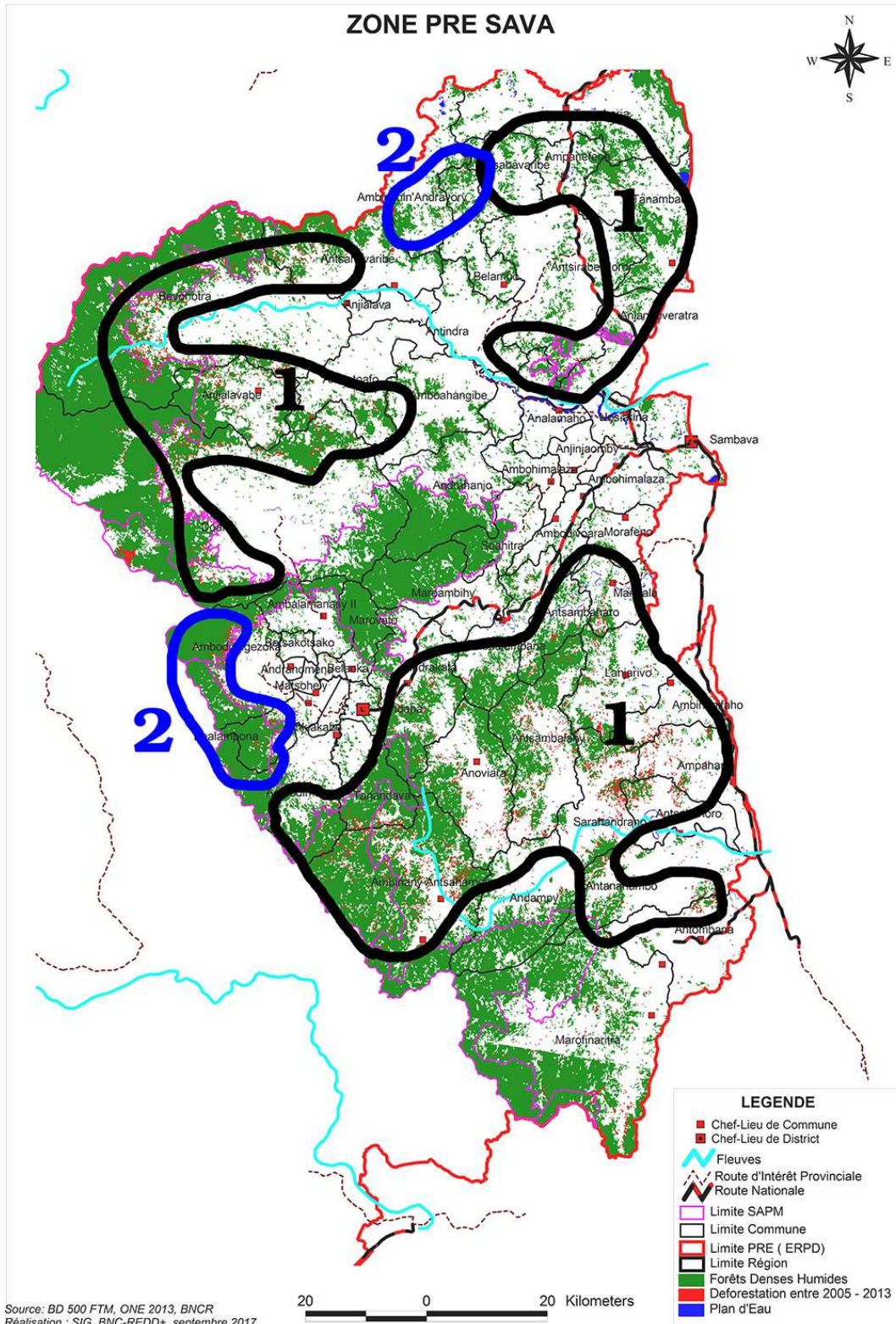
6	Mine	Gold illegal mining	Ambohimanana (Est CAZ)	II - 2	Migrants, Artisanal mine operators, local mine administration and STD
	Forest	Illegal logging		FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
7	Forest	Illegal logging	Anjahamana	FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
	Agriculture	Tavy		AD1 & AD2	Farmers and cooperatives, households
8	Forest	Illegal logging	Ambalarondra	FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
	Agriculture	Tavy		AD1 & AD2	
	Mine	Gold illegal mining		II - 2	Migrants, Artisanal mine operators, local mine administration and STD
	Mine	Future area of mine exploitation		II - 2	Migrants, Artisanal mine operators, local mine administration and STD
9	Energy	Charcoal production	Foulpointe	ED1,(Promotion and vulgarization of sustainable charcoal), ED2	Households, carbonizers
	Tourism	Implementation of tourism without legal rights to settle in of very close to forests		Promotion of eco-tourism	Tourism operators, land tenure offices administration
10	Tourism	Implementation of tourism without legal rights to settle in of very close to forests	Andevoranto	Promotion of eco-tourism	
	Forest	Charcoal production (National Road 5)		ED1,(Promotion and vulgarization of sustainable charcoal), ED2,	Households, coal producers
11	Forest	Charcoal production	Brickaville	ED1,ED2, Autres 1	coal producers
12	Mine	Gold illegal mining	Ambinaninony	II - 2	Migrants, Artisanal mine operators, local mine administration and STD

13	Agriculture	Ethanol production	Ranomafana Est		Farmers and cooperatives, economic operators
	Forest	Illegal logging		FD2, FD1, (monitoring and control, valorization of NTFP)	VOI and loggers
le long de la route RN2	Forest	Wood fire production (National Road 2) and graphite exploitation		ED1,(Promotion and vulgarization of sustainable charcoal), ED2, II-2	Migrants, Artisanal mine operators, local mine administration and STD

Region Sofia



Area on the map	Sector	Causes of D & D	Suggestion of activities	Beneficiaries
1	Agriculture	Tavy because of lack of arable lands, traditional agriculture practices with low productivity	AD1: Improvement of farm practices (SRI and SRA), providing equipment and farm inputs. AD2: Improvement and promotion of sustainable agroforestry (vanilla, coffee, cloves)	Local people, association of producers, farmers
3	Forest	Wood exploitation for diverse uses but local population doesn't have access to seedlings	FD1 and AD2: Reinforcement and capacity training to implement tree nursery in villages in order to supply enough seedlings locally, restore degraded land, and do afforestation to answer local needs in wood	PA managers, VOI, nurserymen
2	Livestock	Bushfire for grazing, customary practices	AD1: Land use management with a fire rotation system, forage crop, vulgarization of legal text constraining bushfires, elaboration and application of Dina within each grazing unit	Livestock farmers, local population, terroir right holders
4	Energy	Energy wood (charcoal and wood fire)	ED1: vulgarization on the use of improved woodstoves, afforestation of fast growing species of trees for charcoal production in non-forest areas.	Local population, households, coal producers and local tree nursery



Area on the map	Sector	Causes of D & D	Suggestion of activities	Beneficiaries
1	Agriculture	Tavy for annual crops (rice) and cash crops (vanilla and coffee)	AD1: Promotion of tree as stake for vanilla production, revitalize the research center on vanilla sector in Ambohitsara/ Antalaha. Promote enhanced farm inputs (seeds) and build capacity. Vulgarization over the content of AD2	Farmers, cooperatives, and economic operators
	Forest	Charcoal production, illegal fire	FD1, FD2, ED1 and ED2 Promotion of green energy and sustainable charcoal Afforestation and forest restoration Sustainable valorization of wood product (Koloala) Reinforcement of human resources and equipment of forest administration Implement incentives mechanism to promote afforestation	Households, forest administration
2	Mine	Local (voluntary) confusion between collect and exploitation authorization, for gold, gems illegal exploitations.	Improve coordination between forest and mine local administrations (for control) Field control coordinated by Region, DREEF, police force, mayors.	CTD and STD, forest and mine administrations (local)

ANNEX II – SUMMARY OF THE FINANCIAL PLAN

<i>Expected uses of funds</i>	<i>Description</i>	2018	2019	2020	2021	2022
		Year 1	Year 2	Year 3	Year 4	Year 5
Costs related to administrative oversight of the ER Program	BNCR + supervision régionale	\$ 970 304	\$ 970 304	\$ 970 304	\$ 970 304	\$ 970 304
Operational and implementation costs related to the actions and interventions that are part of the ER Program	Total of planned investments identified	\$ 6 254 502	\$ 6 254 502	\$ 6 254 502	\$ 6 254 502	\$ 6 254 502
Financing costs (e.g., interest payments on loans)		\$ -	\$ -	\$ -	\$ -	\$ 828 125
Costs related to development and operation of the Reference Level and Forest Monitoring System	See SNSF descriptions	\$ 589 564	\$ 589 564	\$ 589 564	\$ 589 564	\$ 589 564
Costs related to the Implementation of Benefit Sharing Plan and relevant Safeguard Plan(s)	See SIS and FGRM costs	\$ 44 679	\$ 44 679	\$ 44 679	\$ 44 679	\$ 44 679
Costs related to the implementation of the feedback and grievance redress mechanism(s)	See SIS and FGRM costs	\$ 28 930	\$ 28 930	\$ 28 930	\$ 28 930	\$ 28 930
Costs related to stakeholder consultations and information sharing	Sub-regional planning	\$ 224 000	\$ 224 000	\$ 224 000	\$ 224 000	\$ 224 000
Other costs	No other cost known	\$ -	\$ -	\$ -	\$ -	\$ -
Grants		\$ 3 848 306	\$ 3 848 306	\$ 3 848 306	\$ 3 848 306	\$ 3 848 306
Loans		\$ 2 406 196	\$ 2 406 196	\$ 2 406 196	\$ 2 406 196	\$ 2 406 196
Revenue from sale of Emission Reductions - after deduction of the buffer reserve	MT CO ₂ e at 5 USD per Ton	\$ -	\$ -	\$ 37 682 851	\$ -	\$ 31 964 743
Total costs (before taxes)		\$ 8 111 979	\$ 8 111 979	\$ 8 111 979	\$ 8 111 979	\$ 8 940 104
Total sources (before taxes)		\$ 6 254 502	\$ 6 254 502	\$ 43 937 353	\$ 6 254 502	\$ 38 219 245
Net revenue before taxes (=total sources – total uses)		\$ (1 857 477)	\$ (1 857 477)	\$ 35 825 374	\$ (1 857 477)	\$ 29 279 141
Cumulated net revenue carried over		\$ (1 857 477)	\$ (3 714 954)	\$ 32 110 420	\$ 30 252 943	\$ 59 532 084
Marketable ER hoped for (after indicated buffer deduction) in MT CO ₂ eq		2 272 987	2 412 577	2 851 006	3 104 664	3 288 284
5 year total in MT CO ₂ Eq						13 929 519

ANNEX III – DESCRIPTIONS OF THE 15 CATEGORIES USED IN THE ER-P BUDGET CALCULATION

Agricultural sector development

This category regroups all activities pertinent to the agricultural sector, including improvements to farming systems (crops production including rehabilitation of irrigated perimeters, agriculture on slopes, cash crops improvements and development, domestic livestock improvement and diversification, improved feedlots and grazing systems) for production, their infrastructure (including processing, transformation and storage units, roads to access farmlands, irrigation water reservoirs), agricultural policy improvements (taxation and farmer support), agricultural information systems and mechanisms, food security control (diversification of productions, transformation of farm products), but also development of small and medium agricultural businesses or cooperatives (through education, business support, micro credit). This category represents 46.86 M USD or 29.5% of the budget lines, however the directly eligible part of the financing for this category (27.87 M USD) represents 47.3% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (18.98 M USD) represent 19.0% of the total financing considered as indirectly eligible for ER generation.

Forestry sector development

This category regroups all activities pertinent to the forestry sector, including the purchase of seeds, plants and related products (development of seedbanks and plant nurseries, support to forestry agencies and local communities practicing forest management, support for conservation of protected zones and protected areas, maintenance of forestry related infrastructure (fire breaks, roads, watchmen housing...), forestry and biodiversity related monitoring, management plans, rehabilitation efforts, setting up transformation units, active management support. This category represents 24.23 M USD or 15.3% of the budget lines, however the directly eligible part of the financing for this category (21.40 M USD) represents 36.3% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (2.87 M USD) represent 2.8% of the total financing considered as indirectly eligible for ER generation.

Energy sector development

This category regroups all activities pertinent to the energy sector, including private sector investments in renewable small scale energy systems, clean energy distribution mechanisms, new energy sources test and distribution. This category represents 24.21 M USD or 15.3% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represent 24.2% of the total financing considered as indirectly eligible.

Intersector activities

This category regroups all activities that bridge across themes, including land tenure systems implementation and improvement, legal revision of key law texts in support to agriculture + forestry + energy sector and other as required, capacity building for required transversal support in administration, evaluation and updating studies on the sectors, inter and intra governance systems improvements, legal application of texts and support to authorities for application. This category represents 2.47 M USD or 1.6% of the budget lines, however the directly eligible part of the financing for this category (0.27 M USD) represents 0.5% of the total financing considered as directly eligible for ER generation for the project while

the indirectly eligible portion of the funds (2.20 M USD) represent 2.2% of the total financing considered as indirectly eligible for ER generation.

Land use management

This category regroups all activities pertinent to the land use and land use change and the management actions related. This includes improvements to infrastructure for access to project area, development of land use plans and land use management plans as well as zoning plans, installation of key land use information equipment, rehabilitation of key land use management infrastructure (including dams and pumping stations, setup and running costs of land use information agencies at the rural level. This category represents 9.56 M USD or 6.0% of the budget lines, however the directly eligible part of the financing for this category (4.52 M USD) represents 7.7% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (5.04 M USD) represent 5.1% of the total financing considered as indirectly eligible for ER generation.

Economy

This category regroups all activities pertinent to economic improvement. This includes capitalization of climate change funds, payment systems development and implementation (institutional, legal and technical aspects), cash for work incentives schemes and ecosystem services based payments for rewarding ecosystem improving activities. This category represents 32.31 M USD or 20.4% of the budget lines, however the directly eligible part of the financing for this category (1.14 M USD) represents 1.9% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (31.17 M USD) represent 31.2% of the total financing considered as indirectly eligible for ER generation.

Research and Development

This category regroups all activities pertinent to research activities or development of techniques that can be considered as research like. This includes various studies to be conducted to improve the knowledge base of the MERPA (including baseline studies, pure research on agronomy, social and environmental assessments) as well as development tests of systems. This category represents 3.02 M USD or 1.9% of the budget lines, however the directly eligible part of the financing for this category (1.87 M USD) represents 3.2% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (1.15 M USD) represent 1.2% of the total financing considered as indirectly eligible for ER generation.

Capacity building

This category regroups all activities pertinent to improvement of the skills base for the stakeholders, whether they be farmers, business people, government agents... This includes improvements to institutions in charge of various sectors, assistance to management platforms for effective management, training and skills transfers of agents and public stakeholders' beneficiaries of project activities, training of trainers. This category represents 2.67 M USD or 1.7% of the budget lines, however the directly eligible part of the financing for this category (1.44 M USD) represents 2.4% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (1.23 M USD) represent 1.2% of the total financing considered as indirectly eligible for ER generation.

Monitoring and safeguards

This category regroups all activities with a regular monitoring and measuring dimension as well as ensuring safeguards (social and environmental) are respected. This category represent distinct project driven activities that do not fall under the direct responsibility of the REDD+ coordination units but where the results can or may be incorporated within the national forest monitoring system ... This includes audits of various types on the projects, national and regional as well as local workshops for information exchange and data gathering, data acquisition in the field, monitoring by civil society organizations and NGOs,

transparency watch, surveys on public perception and opinion upon project activities implementation. This category represents 1.77 M USD or 1.1% of the budget lines, however the directly eligible part of the financing for this category (0.10 M USD) represents 0.2% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (1.67 M USD) represent 1.7% of the total financing considered as indirectly eligible for ER generation.

Awareness and education

This category regroups all activities encompassing and educational nature, including all awareness raising aspects. This includes support to local communities and promotion of “subject related” activities (family planning, animal husbandry, health and hygiene management, land use management, revenue generating activities development and management, youth promotion) whether it be through workshops, training periods, school extension programmes. This category represents 0.76 M USD or 0.5% of the budget lines, however the directly eligible part of the financing for this category (0.26 M USD) represents 0.4% of the total financing considered as directly eligible for ER generation for the project while the indirectly eligible portion of the funds (0.50 M USD) represent 0.5% of the total financing considered as indirectly eligible for ER generation.

Industry streams (Filières)

This category regroups all activities pertinent to the development of an industry stream, including activities and product value chain improvements, from the producer to the buyer or seller. This includes support to traceability chains, development of value chains, organic farming value chain development, ISO certification or local label development. This category represents 1.23 M USD or 0.8% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represents 1.2% of the total financing considered as indirectly eligible.

Social aspects

This category regroups all activities pertinent to social aspects improvements. This includes setting up family planning support at the local scale, setting up proximity health support and warning systems, improvement of vaccination rate. This category represents 0.27 M USD or 0.2% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represents 0.3% of the total financing considered as indirectly eligible.

Tourism sector development

This category regroups all activities pertinent to the tourism sector development. This includes feasibility studies and evaluation of tourism potential of various sites, development of tourism facilities, support to lemur habituation to human. This category represents 0.47 M USD or 0.3% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represents 0.5% of the total financing considered as indirectly eligible.

Communication

This category regroups all activities pertinent to communication to the public and stakeholders, outside of project management related communication. This includes regional workshops to present key topics from the projects, local competitions in schools, production of small documentary films, produce and air small radio talks and message pieces, produce a regular article piece in popular newsletters and newspapers, support to publication of scientific papers. This category represents 0.05 M USD or 0.03% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represents 0.05% of the total financing considered as indirectly eligible.

Project management

This category regroups all activities related to project management across the funding streams. This category is generally unavoidable for the implementation of any activity group. This includes technical assistance at international as well as national and local level (including project positions as well as support consultants for expert aspects) but also support staff (drivers, guards, accountants...), acquisition of required equipment for project purposes (including office equipment, software and field equipment), acquisition of vehicles, functioning costs but also offices rental and building renovations if required. This category represents 8.81 M USD or 5.6% of the budget lines. It was considered that none of the activities under this category were directly eligible for ER generation. The full amount was therefore considered as indirectly eligible for ER generation and represents 8.8% of the total financing considered as indirectly eligible.

It is hereby further suggested that any reinvestment activity to be considered within the MERP application area should be associated with a management cost of circa 5.6% (for larger projects) – 8.8% (for smaller projects) of the total planned costs in order to ensure the activities can be implemented in a realistic manner.

ANNEX IV – SAFEGUARDS PRINCIPLES AND CRITERIA FOR REDD+ IN MADAGASCAR

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
Principe a : Les activités REDD+ sont cohérentes avec les programmes forestiers nationaux, complètent les objectifs de la politique forestière, tiennent compte des dina, des législations nationales et des conventions et accords internationaux et contribuent au développement durable au sens large				
Critère a1 Se conformer aux dina, aux instruments légaux communaux et régionaux et aux lois nationales et internationales applicables, ainsi qu'aux traités, aux conventions et aux instruments internationaux ratifiés ou adoptés par le pays				
A11 : La disponibilité de documents juridiques et administratifs témoignant la conformité des activités REDD+ aux dina, aux instruments légaux locaux, communaux et régionaux, et aux lois nationales	IA11 : Document justifiant la conformité des activités REDD+ aux instruments légaux au niveau communal, régional (attestation de conformité avec les dina, PCD, SAC) et national	IA111 : Disponibilité publique des documents de planification de la mise en œuvre du SN (PTA) les procédures d'application et les rapports de suivi/évaluation de la mise en œuvre de la stratégie nationale REDD+ approuvés par le COPIL et en cours de validité assurant la conformité de la mise en œuvre réalisation de la SN REDD+ avec les lois nationales.	IA112 : Existence d'un procès-verbal de validation justifiant la conformité des activités REDD+ aux instruments légaux (y compris dina) au niveau communal délivré par le SLC, et au niveau régional délivré par la plateforme régionale	IA113 : Existence d'un procès-verbal de validation justifiant la conformité des activités REDD+ aux instruments légaux (y compris dina) au niveau communal délivré par le SLC, au niveau local et par la plateforme régionale, (et au niveau national délivré par la PFN-REDD+)

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
A12 : La disponibilité de documents juridiques et administratifs témoignant la conformité des activités REDD+ aux engagements internationaux	IA12 : Document justifiant la conformité de la mise en œuvre de la stratégie nationale REDD+ avec les engagements internationaux.	IA121 : Disponibilité publique des rapports de suivi / évaluation de la mise en œuvre de la stratégie nationale REDD+ approuvé par le COPIL assurant la conformité avec les engagements internationaux tels le CCNUCC, CDB, OMD, CEDAW)		
Critère a2 : Assurer la cohérence avec, et la contribution aux objectifs nationaux de politique climatique, y compris les stratégies d'atténuation et d'adaptation				
A21 : Les activités REDD+ au niveau local sont alignées sur les politiques et les mesures d'atténuation et d'adaptation au changement climatique.	IA21 : Document/preuve préparé par BNCR, vérifié par BNCC validé et délivré par MEEF justifiant la cohérence des activités REDD+ avec la politique nationale en matière de changement climatique	IA211 : Disponibilité publique de documents approuvés par le COPIL et en cours de validité concernant la planification de la mise en œuvre de la SN (PTA), les procédures d'application et les rapports de suivi / évaluation justifiant la conformité de la mise en œuvre de la SN REDD+ avec la stratégie nationale en matière de changement climatique	IA212 : Disponibilité publique d'un PTA et RAT approuvés par le BRCC justifiant la conformité avec la stratégie nationale en matière de changement climatique de la mise en œuvre des activités REDD+, au niveau communal ou intercommunal,	IA213 : Disponibilité publique d'un PTA et RAT validés par le BNCR justifiant la conformité avec la stratégie nationale en matière de changement climatique de la mise en œuvre des Grands projets REDD+ (GPR)
Critère a3 Assurer la cohérence avec, et la contribution aux stratégies nationales de réduction de la pauvreté et aux objectifs de développement durable, y compris les stratégies et plans des autres secteurs, ainsi que les référentiels régionaux de développement.				

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
A31 : Les activités REDD+ au niveau local sont alignées sur les stratégies nationales de réduction de la pauvreté et aux objectifs nationaux de développement durable	IA31 : Document délivré par l'organisme compétent justifiant la cohérence des activités REDD+ avec les stratégies nationales de réduction de pauvreté (PND, PEDD, SNAT)	IA311 : Disponibilité publique de l'approbation du PTA et RAT, procédures d'application et rapports (SN) par le COPIL préalablement validé par la plateforme REDD+ nationale justifiant la cohérence de la mise en œuvre de la SN REDD+ avec les stratégies nationales de réduction de pauvreté (PND, PEDD, SNAT)	IA312 : Disponibilité publique du PTA et RAT validés par les SLC et la plateforme REDD+ régionale concernées justifiant la cohérence de la mise en œuvre des activités REDD+ avec les SRAT, SAC et PCD	IA313 : Disponibilité publique du PTA et RAT validés par les SLCs et les plateformes REDD+ régionale concernées justifiant la cohérence de la mise en œuvre des activités REDD+ avec les SRAT, SAC et PCD
Critère a4 Assurer la cohérence avec, et la contribution aux politiques de préservation de la biodiversité nationale, aux autres objectifs de politiques environnementales et de gestion des ressources naturelles, aux programmes forestiers nationaux et aux engagements internationaux à la stratégie national REDD+.				
A41 : Les activités REDD+ sont alignées sur les politiques et stratégies environnementales pertinentes existantes à Madagascar	IA41 : Document justifiant la cohérence des activités dans le cadre du projet REDD+ avec la stratégie nationale de préservation de la biodiversité, politique environnementale (Polfor, Pnae, PEDD, COAP, Stratégie nationale de gestion durable de la biodiversité)	IA411 : Disponibilité publique du PTA et RAT validés par le COPIL justifiant la cohérence de la mise en œuvre de la SN REDD+ avec les stratégies nationales environnementales (PND, PEDD, COAP, Stratégie nationale de gestion durable de la biodiversité)	IA412 : Disponibilité publique du PTA et RAT validés par la BRRCR/PF justifiant la cohérence de la mise en œuvre des activités REDD+ avec les stratégies nationales de réduction de pauvreté (PND, PEDD, COAP, SNGDB)	IA413 : Disponibilité publique du PTA et RAT validés par la BRRCR et la PFR ainsi que le BNCR/PFN
Principe b : La stratégie nationale REDD+ contribue à la transparence et l'efficacité des structures nationales de gouvernance forestière tenant compte de la législation et de la souveraineté nationale				
Critère b1 Assurer l'intégrité, la transparence et la redevabilité dans la gestion des fonds et des financements de la stratégie REDD+				

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
B11 : Les rapports annuels sur la gestion des fonds REDD+ sont accessibles aux parties prenantes et au public	IB11 : Document fournissant les informations sur la gestion des fonds REDD+	IB111 : Disponibilité publique des rapports financiers annuels de la structure en charge de la gestion des fonds REDD+ (BNCR)	IB112 : Disponibilité publique des rapports financiers annuels de la structure en charge de la gestion des fonds REDD+ (BRCR)	IB113 : Existence d'un document fournissant les informations sur la gestion des fonds REDD+ (rapport financier annuel) pour chaque grand projet REDD + (GPR)
B12 : Les procédures pour la gestion des fonds REDD+ sont bien définies et appliquées	IB12 : Manuel des procédures financières et administratives claire et validé par l'entité compétente pour chaque projet REDD+	IB121 : Disponibilité publique d'un manuel de procédure pour BNCR et pour tous les projets REDD+ validé, et des preuves de la mise en œuvre de la procédure ; Rapports d'audit annuel préparé par une entité indépendante	IB122 : Preuve de mise en œuvre effective des procédures en cours de validité. Rapports d'audit annuel préparé par une entité indépendante	IB123 : Preuve de mise en œuvre effective des procédures en cours de validité. Rapports d'audit annuel préparé par une entité indépendante.
		IB124 : Disponibilité publique de l'organigramme précisant les fonctions, les objectifs et les missions, les obligations de gestion/suivi/publication d'information de la structure en charge de la gestion des fonds REDD+ (nationale)	IB125 : Disponibilité publique de l'organigramme précisant les fonctions, les objectifs et les missions, les obligations de gestion/suivi/publication d'information de la structure en charge de la gestion des fonds REDD+ (communal)	Non applicable
Critère b2 Assurer la transparence et l'accès à toutes les informations relatives à la REDD+, notamment la diffusion effective auprès du public en vue de promouvoir une conscientisation générale et la bonne gouvernance.				

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
B21 : Les informations concernant les activités REDD+ sont accessibles au public	IB21 : Disponibilité des informations sur les activités REDD+ pour le public	IB211 : Disponibilité publique à travers plusieurs supports (web, papiers, audio-visuel, etc.) de l'ensemble des informations pertinentes, règles et procédures liées à la SN	IB212 : Disponibilité publique à travers plusieurs supports (web, papiers, audio-visuel, etc.) de l'ensemble des informations pertinentes, règles et procédures liées aux activités REDD+ régionale	IB213 : Disponibilité publique à travers plusieurs supports (web, papiers, audio-visuel, etc.) de l'ensemble des informations pertinentes et non confidentielles liées au projet
Critère b3 Promouvoir la coordination, la culture de résultats, et la coopération entre les secteurs pour la bonne gouvernance du secteur forestier et celle d'autres secteurs pertinents.				
B31 : Disponibilité des structures et processus de coordination du secteur forestier et les autres secteurs pertinents pour les activités REDD+	IB31 : Document prouvant l'opérationnalité des plateformes REDD+ (national, régional) et SLC au niveau local, et preuve de participation des différents Ministères en charge de <ul style="list-style-type: none"> - Forêts - Eau - Agriculture et Elevage - Pêche - Energie - Hydrocarbures - Mines - Aménagement du territoire - Finances - Décentralisation - Justice - Gendarmerie 	IB311 : Les PV de toutes les réunions de la plateforme REDD+ nationale, une copie de l'invitation avec liste des destinataires et des fiches de présence de tous les participants sont disponibles publiquement.	IB312 : Les PV de toutes les réunions périodiques de la plateforme REDD+ régionale, une copie de l'invitation avec liste des destinataires et des fiches de présence de tous les participants sont disponibles publiquement.	Non applicable

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
	02 Représentants des <ul style="list-style-type: none"> - organismes nationaux œuvrant dans la protection de l'environnement - des fédérations des communautés de base - du secteur privé - des Partenaires Techniques Internationaux - des Partenaires Financiers - des régions - des universités et organismes de recherche 			
Principe c : La stratégie REDD+ reconnaît et respecte les connaissances et les droits aux terres et aux ressources des communautés locales				
Critère c1 Identifier les différents détenteurs des droits (statutaires et coutumiers) et leurs droits aux terres et aux ressources liées aux activités REDD+				
C11 : Les différents détenteurs des droits (statutaires et coutumiers) et leurs droits aux terres et aux ressources dans les zones de mise en œuvre de REDD+ sont identifiés et cartographiés	IC111 : Base de données/Carte des ayants droits dans les zones concernées par les activités REDD+	IC1111 : Disponibilité publique des directives de la stratégie nationale en matière de respect des connaissances et en matière de reconnaissances des droits aux terres et aux ressources, y compris des communautés locales	IC1112 : Disponibilité publique d'une base de données exhaustive/Carte (PLOF) des ayants droits dans les zones d'intervention des activités REDD+	IC1113 : Disponibilité publique d'une base de données exhaustive/Carte (PLOF) des ayants droits dans les zones d'intervention du projet REDD+

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
Critère c2 Identifier et respecter les connaissances traditionnelles et le patrimoine et les pratiques culturelles.				
C21 : Disponibilité des documents sur les connaissances traditionnelles, le patrimoine et les pratiques culturelles liées aux activités REDD+	IC21 : Recueil des connaissances traditionnelles, des traditions locales et les pratiques culturelles liées aux activités REDD+	Non applicable	IC211 : Disponibilité publique d'un recueil des traditions locales et les pratiques culturelles liées aux activités REDD+	IC212 : Disponibilité publique d'un recueil des traditions locales et les pratiques culturelles liées aux activités REDD+
C22 : Disponibilité de mécanismes permettant d'assurer le respect des connaissances traditionnelles avec procédures de partage équitable des avantages issues de l'utilisation des connaissances traditionnelles	IC22 : Structure de dialogue au niveau local permettant de se concerter avec les représentants de communautés (choisis par les communautés concernées, par exemple : Tangalamena) sur le respect des connaissances traditionnelles et les pratiques culturels	Non applicable	IC221 : Existence et fonctionnement effectif des structures locales de concertation (SLC) au niveau communal et intercommunal dans toutes les zones de mise en œuvre des activités REDD+ permettant de se concerter avec des représentants choisis par les communautés concernées sur le respect des connaissances traditionnelles et les pratiques culturels	IC222 : Existence et fonctionnement effectif d'une structure locale de concertation (SLC) dans toutes les zones de mise en œuvre des activités REDD+ permettant de se concerter avec les représentants choisis par les communautés concernées, sur le respect des connaissances traditionnelles et les pratiques culturels

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
C23 : La conception, la mise en œuvre et l'évaluation de la stratégie REDD+ est bâtie en respectant et en s'appuyant sur les connaissances, les compétences et les systèmes de gestion traditionnels ou autres, des détenteurs de droits, des parties prenantes et des communautés locales	IC23 :Preuve d'obtention de consentement libre et informé au préalable (CLIP) pour toute utilisation des connaissances traditionnelles, innovations et pratiques des communautés locales pour les activités REDD+. Représentativité des parties prenantes engagées dans le processus de formalisation du CLIP.	IC231 : Existence d'un Manuel et/ou de directives nationales en matière d'obtention du CLIP spécifiquement relatif à l'utilisation des connaissances	IC232 : Preuve d'obtention de consentement libre, et informé au préalable (CLIP) pour toute utilisation des connaissances traditionnelles, innovations et pratiques des communautés locales pour les activités REDD+. Nombre, pertinence et représentativité des parties prenantes signataires du CLIP. Disponibilité publique d'une preuve d'implication des tangalamena, autorité administrative dans le processus de formalisation du CLIP	IC233 :Preuve d'obtention de consentement libre, et informé au préalable (CLIP) pour toute utilisation des connaissances traditionnelles, innovations et pratiques des communautés locales pour les activités REDD+. Nombre, pertinence et représentativité des parties prenantes signataires du CLIP. Disponibilité publique d'une preuve d'implication des tangalamena, autorité administrative dans le processus de formalisation du CLIP
Critère c3 Veiller à ce qu'il n'y ait aucune réinstallation involontaire ni de restriction à l'accès aux ressources suite aux activités REDD+				
C31 : Transparence en matière de risques de réinstallation involontaire ou de restriction d'accès aux ressources des activités REDD+. Transparence concernant les personnes effectivement	IC31 : Base de données et cartes des Personnes Affectées par le Projet (PAP) avec risque de réinstallation involontaire et restriction d'accès aux ressources naturelles	IC311 : Disponibilité publique des directives nationale REDD+ en matière de réinstallation involontaire et restriction d'accès aux ressources	IC312 : Disponibilité de cartes / listes des Personnes Affectées par le Projet (PAP) identifiées, y compris leurs droits dans le domaine des risques de réinstallation ou restriction d'accès aux ressources des activités REDD+	IC313 : Disponibilité de cartes / listes des Personnes Affectées par le Projet (PAP) identifiées, y compris leurs droits dans le domaine des risques de réinstallation ou restriction d'accès aux ressources des activités REDD+

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affectées par la survenance de ces risques.				
C32 : Identification des activités REDD+ avec risque de réinstallation involontaire ou restriction d'accès aux ressources sont identifiées	IC32 : Liste des projets avec risque de réinstallation involontaire ou restriction d'accès aux ressources	IC321 : Nombre et pourcentage de projets REDD+ avec fiche de tri/catégorisation environnementale et sociale catégorisée par ONE pour risque de réinstallation involontaire ou restriction d'accès aux ressources ayant pu identifier la liste des activités avec risque de réinstallation ou restriction d'accès aux ressources	IC322 : Disponibilité publique de la décision d'ONE sur la risque de réinstallation involontaire ou restriction d'accès aux ressources et les actions à entreprendre (évaluation sociale et économique, PAR etc.).	IC323 : Disponibilité publique de la décision d'ONE sur la risque de réinstallation involontaire ou restriction d'accès aux ressources et les actions à entreprendre (évaluation sociale et économique, PAR etc.).
C33 : Transparence, efficacité et équité de traitement des personnes affectées par le projet.	IC33 : Plans de réinstallation approuvés. Procédures de réinstallation et de compensation des personnes affectées systématiquement appliquées.	IC331 : Nombre et pourcentage de projets REDD+ dont des risques de réinstallation ou restriction d'accès aux ressources sont identifiées ayant un plan de réinstallation approuvé. Nombre et pourcentage des projets REDD+ ayant procédé à des réinstallations qui ont respecté leur procédure de compensation des personnes affectées	IC332 : Disponibilité publique des plans de réinstallation approuvés et de la procédure de réinstallation et/ou compensation. Caractère effectif de la compensation des personnes affectées.	IC333 : Disponibilité publique d'un plan de réinstallation approuvé et de la procédure de réinstallation et/ou compensation. Caractère effectif de la compensation des personnes affectées.
Critère c4 Obtenir le consentement préalable donné librement et en connaissance de cause des communautés locales pour toute activité ayant une incidence sur leurs droits aux terres et aux ressources, ainsi que respecter et défendre la décision prise.				

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
C41 : Disponibilité d'un processus documenté pour obtenir le CLIP des communautés locales affectées par les activités REDD+	IC41 : Existence d'un Manuel et/ou de directives nationales en matière d'obtention du CLIP pour les activités REDD+	IC411 : Disponibilité publique d'un standard national y-compris des procédures en matière de CLIP (selon la SN)	Non applicable	Non applicable
C42 : Le CLIP est obtenu des communautés locales pour la mise en œuvre de chaque activité ayant une incidence sur leurs droits aux terres et aux ressources en conformité avec le standard national et les preuves sont rendus publiques pour respecter et défendre les décisions prises	IC42 : Accord écrit entre le responsable d'un projet REDD+ et les communautés locales se portant sur le consentement de ces dernières pour la mise en œuvre de chaque activité ayant une incidence sur leurs droits aux terres et aux ressources en conformité avec le standard national (chaque activité et chaque changement des activités avec incidence sur les droits doivent faire l'objet d'un accord)	IC421 : Disponibilité publique des documents justifiant le nombre et pourcentage de projets REDD+ ayant obtenus le CLIP des communautés locales pour chaque activité entraînant une incidence sur leurs droits aux terres et aux ressources.	IC422 : Existence des accords publiés avec les communautés locales mentionnant leur consentement obtenu suivant les [directives/procédures] nationales pour la mise en œuvre des activités ayant une incidence sur leurs droits aux terres et aux ressources	IC423 : Existence des accords publiés avec les communautés locales obtenu suivant les [directives/procédures] nationales mentionnant leur consentement pour la mise en œuvre des activités ayant une incidence sur leurs droits aux terres et aux ressources
Principe d : Toutes les parties prenantes en particulier les communautés locales participent pleinement et efficacement aux activités REDD+				
Critère d1 Assurer la participation pleine et effective de toutes les parties prenantes qui veulent s'impliquer dans la conception, la mise en œuvre, le suivi et l'évaluation de la stratégie REDD+ à travers une participation culturelle appropriée et efficace, en prêtant une attention particulière aux groupes les plus vulnérables.				
D11 : Les parties prenantes des activités REDD+ sont identifiées	ID11 : Liste des parties prenantes pour chaque étape du processus des activités REDD+	ID111 : Disponibilité publique des directives de la SN sur l'identification et la participation des parties prenantes	ID112 : Disponibilité publique de la liste des parties prenantes ou groupes de parties prenantes pour chaque étape du processus des projets allant de la conception jusqu'au suivi	ID113 : Disponibilité publique de la liste des parties prenantes ou groupes de parties prenantes pour chaque étape du processus du

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
				projet allant de la conception jusqu'au suivi
D12 : Les parties prenantes sont réellement engagées	ID12 : Plan de participation spécifiant les méthodes et les activités pour assurer la participation effective de chaque groupe de partie prenante identifiée	ID211 : Existence d'un mécanisme/démarche impliquant les parties prenantes pour chaque étape du processus de la Stratégie Nationale REDD+ allant de la conception jusqu'au suivi Nombre et pourcentage de projets REDD+ ayant un mécanisme/démarche impliquant les parties prenantes pour chaque étape du processus du projet allant de la conception jusqu'au suivi	ID212 : Existence d'un mécanisme/démarche impliquant les parties prenantes pour chaque étape du processus des projets allant de la conception jusqu'au suivi	ID213 : Existence d'un mécanisme/démarche impliquant les parties prenantes pour chaque étape du processus du projet allant de la conception jusqu'au suivi
D13 : Implication effective des groupes de parties prenantes dans la conception, la mise en œuvre, le suivi et l'évaluation des activités REDD+	ID13 : Preuves documentées (fiche de présence) des parties prenantes impliquées dans la conception, la mise en œuvre, le suivi et l'évaluation de la stratégie REDD+	ID131 : Nombre et pourcentage de projets REDD+ ayant une preuve écrite de l'implication suffisante des groupes de parties prenantes dans les différentes étapes du	ID132 : Existence d'une preuve documentée, telle que la fiche de présence des parties prenantes impliquées dans la conception, la mise en œuvre, le suivi et l'évaluation des projets REDD+	ID133 : Existence d'une preuve documentée, telle que la fiche de présence des parties prenantes impliquées dans la conception, la mise en œuvre, le suivi et

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
		processus du projet		l'évaluation des grands projets REDD+
Critère d2 S'assurer que les parties prenantes disposent des informations suffisantes, fournies d'une manière culturellement appropriée et à temps concernant la REDD+, ainsi que la capacité à participer pleinement et effectivement à la conception, à la mise en œuvre et à l'évaluation de la stratégie REDD+.				
D21 : Les parties prenantes reçoivent à temps voulu les informations sur les activités, les impacts, le partage des avantages du programme/projet REDD+. et au format adapté, avec attention spécifique aux groupes vulnérables	ID211 : Stratégie/Plan de communication prenant en considération les différentes cultures de tous les groupes de parties prenantes identifiées'	ID2111 : Disponibilité publique de la stratégie /plan de communication REDD+ (SN)	ID2112 Disponibilité effective auprès de toutes les parties prenantes de documents qui expliquent la SN et les projets REDD+, élaborés sous un format et sur un support adapté aux spécificités des différents groupes de parties prenantes ou existence des séances d'information du public sur les activités, impacts et le partage des avantages du programme REDD+ (surtout pour les illettrés)	ID2113 Disponibilité effective auprès de toutes les parties prenantes de documents qui expliquent la SN et les projets REDD+, élaborés sous un format et sur un support adapté aux spécificités des différents groupes de parties prenantes ou existence des séances d'information au public sur les activités , impacts et le partage des avantages du programme REDD+ (surtout pour les illettrés)
	ID212 : Pourcentage des informations partagées reçues par les parties prenantes, Niveau de compréhension des parties prenantes des informations partagées	ID2121 : Disponibilité publique d'un rapport sur l'impact/effet de la mise en œuvre du plan de communication	ID2122 : Disponibilité publique d'un rapport sur l'impact/effet de la mise en œuvre du plan de communication de la stratégie nationale et des projets REDD+ dans la région	ID2123 : Disponibilité publique d'un rapport sur l'impact/effet de la mise en œuvre du plan de communication de la stratégie nationale et des projets REDD+ dans la

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
				région
Critère d3 Assurer la responsabilité et la légitimité de tous les organes qui représentent les parties prenantes				
D31 : Les membres des plateformes et autres entités de concertation REDD+ sont désignés officiellement par les 9 groupes/catégories] de parties prenantes qu'ils représentent	ID31 : Preuve écrite justifiant la légitimité des représentants des membres de la plateforme REDD+	ID311 : Existence d'une preuve écrite justifiant la légitimité des représentants de chaque catégorie des parties prenantes membre de la plateforme nationale	ID312 : Existence d'une preuve écrite justifiant la légitimité des représentants de chaque catégorie des parties prenantes membre de la plateforme REDD+ (régionale)	Non applicable
Critère d4 Promouvoir et renforcer l'approche genre et l'autonomisation des femmes.				
D41 : Transparence de la différenciation des impacts des activités REDD+ entre les femmes et les hommes	ID41 : Cartographie des intérêts et impacts différenciés entre les femmes et les hommes pour les activités REDD+	ID411 : Disponibilité de la stratégie pour l'intégration de l'approche genre et autonomisation des femmes (SN)	ID412 : Disponibilité publique de la cartographie des intérêts et impacts différenciés entre les femmes et les hommes pour les différentes activités REDD+	ID413 : Disponibilité publique de la cartographie des intérêts et impacts différenciés entre les femmes et les hommes pour les différentes activités REDD+
D42 : Mise en œuvre des projets et activités REDD+ favorisant l'autonomisation des femmes, particulièrement celles des communautés	ID42 : Liste des activités REDD+ mis en œuvre favorisant l'autonomisation des femmes	ID421 : Disponibilité publique d'un rapport d'évaluation de la prise en considération de l'approche genre et autonomisation des femmes dans les activités REDD+ de la stratégie nationale	ID422 : Disponibilité publique de la liste des activités REDD+ mises en œuvre favorisant l'autonomisation des femmes	ID423 : Disponibilité publique de la liste des activités REDD+ mis en œuvre favorisant l'autonomisation des femmes

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
locales				
D53 : Le suivi / évaluation de l'accès effectif aux avantages REDD+ est sexospécifique	ID53 : Ecart hommes / femmes dans l'accès aux avantages des activités REDD+	ID531 : Nombre de bénéficiaires hommes / femmes	ID532 : Nombre de bénéficiaires hommes / femmes	ID533 : Nombre de bénéficiaires hommes / femmes
Critère d6 Traiter efficacement les réclamations et les disputes liées à la conception, la mise en œuvre et l'évaluation de la stratégie REDD+, y compris les disputes liées au programme concernant les droits aux terres et aux ressources.				
D61 : Existence d'un mécanisme de gestion de plainte fonctionnel et accessible aux parties prenantes	ID611 : Mécanisme de gestion des plaintes fonctionnel	ID6111 : Disponibilité d'un guide de résolution /traitement des plaintes dans le cadre des projets REDD+ (SN)	ID6112 : Existence d'un mécanisme de gestion des plaintes fonctionnel au niveau des projets REDD+	ID6113 : Existence d'un mécanisme de gestion des plaintes fonctionnel au niveau du projet REDD+
	ID612 : Document /base de données contenant les informations relatives aux plaintes	ID6121 : Existence d'un MGP fonctionnel et accessible Rapport sommaire du nombre de plaintes reçues, des différents types, des différentes zones, délai moyen de résolution, types de recours	ID6122 : Disponibilité publique des griefs des personnes, accessibilité effective au dépôt de grief Délai moyen de résolution des griefs.	ID6123 : Disponibilité publique des griefs des personnes, accessibilité effective au dépôt de grief Délai moyen de résolution des griefs.
D63 : Les plaintes liées à la REDD+ sont traitées	ID63 : Proportion des plaintes traitées par rapport aux plaintes enregistrées	ID631 : Nombre et pourcentage des plaintes résolues parmi les plaintes enregistrées	ID632 : % des plaintes résolues parmi les plaintes enregistrées	ID633 : % des plaintes résolues parmi les plaintes enregistrées

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
Principe e : La stratégie REDD+ protège les forêts naturelles contre la dégradation ou leur conversion, accroît les avantages qu'offre la conservation de la biodiversité et des services écosystémiques, et améliore la sécurité des moyens de subsistance et le bien-être à long terme des communautés locales en accordant une attention spéciale aux femmes et aux personnes les plus vulnérables				
Critère e1 Veiller à ce que les activités de la REDD+ ne provoquent pas la conversion des forêts naturelles en d'autres utilisations des terres, y compris les plantations forestières, et faire de la réduction de leur conversion une priorité de la REDD+.				
E11 : La superficie totale des forêts naturelles dans chaque commune est maintenue dans les zones de mise en œuvre des activités REDD+	IE11 : Evolution de la superficie totale des forêts naturelles dans les zones de mise en œuvre des activités REDD+	IE111 : Disponibilité publique de la cartographie sur l'évolution des superficies des forêts naturelles dans les zones de mise en œuvre des activités REDD+	IE112 : Evolution de la superficie totale des forêts naturelles dans les zones de mise en œuvre des activités REDD+	IE113 : Evolution de la superficie totale des forêts naturelles dans les zones de mise en œuvre des activités REDD+
Critère e2 Minimiser la dégradation des forêts naturelles et faire de la réduction de leur dégradation une priorité de la REDD+				
E21 : La lutte contre les moteurs de dégradation des forêts fait partie des priorités de la REDD+	IE21 : Existence d'activités REDD+ contribuant à la lutte contre les moteurs de dégradation des forêts	IE211 : Disponibilité publique et mise à jour périodique de l'inventaire des moteurs de dégradation des forêts naturelle et des moyens d'atténuation à privilégier	IE212 : Existence des activités REDD+ contribuant à la lutte contre les moteurs de dégradation des forêts naturelles	IE213 : Existence des activités REDD+ contribuant à la lutte contre les moteurs de dégradation des forêts naturelles
Critère e3 Veiller à ce que la planification de l'utilisation des terres et les activités REDD+ tienne explicitement compte des services rendus par les écosystèmes et de la conservation de la biodiversité en lien avec les valeurs des parties prenantes locales, des synergies éventuelles et des arbitrages potentiels entre les différents avantages.				
E31 : Les services écosystémiques de valeur pour les populations locales dans les zones de mise en œuvre des activités REDD+ sont identifiés et maintenus	IE311 : Liste des services écosystémiques de valeur pour les populations locales dans les zones de mise en œuvre des activités REDD+	IE3111 : Disponibilité publique des directives de la stratégie nationale sur l'identification, maintien et le suivi des services écosystémiques de valeur pour les populations locales dans les zones d'intervention REDD+	IE3112 : Existence d'une liste des services écosystémiques avec priorisation selon leur degré d'importance pour les populations locales et rapport d'évaluation de leur évolution dans les zones de mise en œuvre des activités REDD+	IE3113 : Existence d'une liste des services écosystémiques avec priorisation selon leur degré d'importance pour les populations locales et rapport d'évaluation de leur évolution dans les

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
				zones de mise en œuvre des activités REDD+
	IE312 : Changement du niveau d'eau dans les rivières principales en période d'étiage et en saison de pluie	IE3121 : Nombre et pourcentage de projets REDD+ ayant pu maintenir les ressources hydriques	IE3122 : Evolution du niveau d'eau dans les rivières principales en période d'étiage et en saison de pluie	IE312 3 : Evolution du niveau d'eau dans les rivières principales en période d'étiage et en saison de pluie
	IE313 : Evolution du taux d'accès de la population en eau potable	Non applicable	IE3131 : % des populations ayant accès à l'eau potable	IE3132 : % des populations ayant accès à l'eau potable
E32 : Un Plan de gestion et de suivi pour la réduction des menaces sur les espèces menacées, est opérationnel dans les zones de mise en œuvre des activités REDD+	IE32 : Preuve de réduction des menaces ou maintien des populations d'espèces menacées dans les zones de mise en œuvre des activités REDD+	IE321 : Nombre et pourcentage de projets REDD+ ayant une preuve de réduction des menaces ou maintien des espèces menacées dans les zones de mise en œuvre des activités REDD+	IE322 : Preuve de réduction des menaces ou maintien des espèces menacées dans les zones de mise en œuvre des activités REDD+	IE323 : Preuve de réduction des menaces ou maintien des espèces menacées dans les zones de mise en œuvre des activités REDD+. Il est à signaler que La méthodologie de mesure de la réduction des menaces sera identifiée par BNCR ultérieurement
Critère e4 Protéger et renforcer le bien-être économique et social des parties prenantes concernées, en produisant des impacts positifs supplémentaires sur la sécurité des moyens de subsistance à long terme des communautés locales tout en réduisant les effets néfastes qui pèsent sur elles, avec une attention particulière aux groupes les plus vulnérables.				
E41 : Réduction des effets néfastes et augmentation des impacts positifs assurant la sécurité des	IE41 : Situation de bien être des communautés locales	IE411 :Disponibilité publique d'une stratégie d'amélioration de bien être des communautés locales touchées par les	IE412 : Disponibilité publique d'une étude d'impact social/économique et d'un plan d'atténuation des impacts négatifs et de renforcement de la situation économique	IE413 : Disponibilité publique d'une étude d'impact social/économique et d'un

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
moyens de subsistance à long terme		<p>activités REDD+ (BNCR) et d'un rapport d'évaluation des impacts sur le bien être des communautés des projets REDD+ (BNCR)</p> <p>Nombre et pourcentage des projets REDD+ avec disponibilité publique d'une étude d'impact social/économique et d'un plan d'atténuation des impacts négatifs et de renforcement de la situation économique des communautés locales validés</p>	des communautés locales validés (BRCR)	plan d'atténuation des impacts négatifs et de renforcement de la situation économique des communautés locales validés (Promoteur de projet)
			IE414 : Evolution de l'indice de bien être des communautés locales. Il est à signaler que La méthode de calcul de l'indice de bien être des communautés sera identifiée par BNCR ultérieurement	IE415 : Evolution de l'indice de bien être des communautés locales.
Principe des mesures visant à prendre en compte les risques d'inversion sont mises en œuvre notamment le partage équitable des avantages des activités REDD+ entre toutes les parties prenantes pertinentes (voir mécanisme de partage des avantages)				
Critère f1 Evaluer et traiter les risques d'inversion des réalisations REDD+, y compris les futurs risques potentiels pour les stocks de carbone forestier et d'autres avantages afin d'assurer l'efficacité et l'efficacité du mécanisme REDD+.				
F11 : l'évaluation des risques d'inversion des réalisations des activités REDD+ en matière de	IF11 : Facteurs de risque d'inversion des réalisations des activités REDD+ identifiés	IF111 : Nombre de projets REDD+ ayant déjà identifié les facteurs de risque d'inversion des réalisations REDD+	IF112 : Existence et actualisation fréquente de la liste des facteurs de risque d'inversion des réalisations REDD+	IF113 : Existence et actualisation fréquente de la liste des facteurs de risque d'inversion des

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
réduction d'émissions GES et sur les plans social et environnemental				réalisations REDD+
F12 : Réduction des risques d'inversion des réalisations des activités REDD+	IF12 : Rapport de mise en œuvre de stratégie d'atténuation des risques d'inversion des réalisations des activités REDD+	IF121 : Nombre et pourcentage de projets REDD+ ayant un document de stratégie d'atténuation des risques et produisant des rapports de suivi d'évaluation des risques d'inversion des réalisations des activités REDD+	IF122 : Rapport annuel d'évaluation et de suivi des risques d'inversion des réalisations des activités REDD+, et évaluation de l'évolution des risques	IF123 : Rapport annuel d'évaluation et de suivi des risques d'inversion des activités REDD+, évaluation de l'évolution des risques
F21 : Transparence en matière d'équité de répartition des avantages entre les parties prenantes concernées et de l'attention particulière portée aux groupes vulnérables	IF21 : Existence d'un mécanisme de partage des avantages selon une démarche concertée avec les communautés locales	IF211 : Disponibilité publique des directives de la SN sur le mécanisme de partage équitable, sans discrimination et avec attention particulière portée aux groupes vulnérables	IF212 : Existence d'un mécanisme de partage des avantages déjà fonctionnel approuvé par les communautés locales (ex : comité de concertation locale) avec dispositions particulières spécifiques envers les groupes vulnérables; Effectivité de ce mécanisme et des dispositions particulières.	IF213 : Existence d'un mécanisme de partage des avantages déjà fonctionnel approuvé par les communautés locales (ex : comité de concertation locale) avec dispositions particulières spécifiques envers les groupes vulnérables; Effectivité de ce mécanisme et des dispositions particulières.
G12 : Atténuation des risques de déplacements d'émissions	IG12 : Identification des risques et zones de déplacement de déforestation, Plan d'atténuation des risques de déplacements de la déforestation et rapport	IG211 : Nombre de projets REDD+ ayant un plan d'atténuation du déplacement de l'émission	IG212 : Existence d'un plan d'atténuation du déplacement de l'émission, % de réalisation du plan	IG213 : Existence d'un plan d'atténuation du déplacement de l'émission, % de réalisation du plan

Résultats attendus	Indicateur	Indicateur de performance de la Stratégie Nationale REDD+	Indicateur de performance des projets REDD+ Communaux/Intercommunaux	Indicateur de performance des grands projets REDD+
	d'évaluation de l'évolution de déforestation dans ces zones			

ANNEX V – PROPOSITION OF IMPLEMENTATION OF FGMR FOR REDD+ PER TYPE OF ACTORS AND COMPLAINTS

Niveau	Intervenants	Types de plaintes	Réception Accusé de réception	Localisation	Proposition de réponse Communication au plaignant	Mise en œuvre de la réponse					Clôture	Autres
						Actions directes	Evaluation approfondie	Recherche de solution (médiation arbitrage)	Retour d'information	Suivi de la mise en œuvre		
Niveau local	VOI / Fédération des VOI	Plaintes liées à l'utilisation des ressources dont les objets correspondent au DINA	Oui Transmission à CEEF pour BDD	Zones de transfert de gestion	Oui	Oui		Application Dina	Oui	Oui	Oui	
	Autorités traditionnelles	Plaintes liées à l'utilisation des R.N, sociales et culturelles et culturelles pouvant potentiellement causer préjudice à l'ordre socio-organisationnel local voire régional	Oui Transmission à CEEF pour BDD	Hameau Fokontany Zones d'appartenance ethnique	Oui	Oui			Oui	Oui	Oui	
	Chef Fokontany	Plaintes sociales, foncières et liées à l'utilisation des R.N d'envergure local	Oui Transmission à CEEF pour BDD	Hameau Fokontany	Oui	Oui			Oui	Oui	Oui	
Niveau communal	Commune / intercommunal (OPCI)	- Plaintes sociales, foncières et liées à l'utilisation des R.N d'envergure inter- fokontany et inter- communale	Oui Transmission à CEEF pour BDD	Inter- Fokontany Inter- communal	Oui	Oui	Coordination / Facilitation SLC	Coordination / Facilitation SLC	Oui	Coordination / Facilitation SLC	Oui	

Niveau	Intervenants	Types de plaintes	Réception Accusé de réception	Localisation	Proposition de réponse Communication au plaignant	Mise en œuvre de la réponse					Clôture	Autres
						Actions directes	Evaluation approfondie	Recherche de solution (médiation arbitrage)	Retour d'information	Suivi de la mise en œuvre		
	SLC (Commune)	- Plaintes liées à la gouvernance se rapportant aux conflits d'intérêt d'utilisation de l'espace - Plaintes non résolues au niveau fokontany					Oui	Oui		Oui		
	Gestionnaire de Projet	- Plaintes liées à l'application de la loi dans la ou les zones d'action du projet	Oui Transmission à CEEF pour BDD	Site du projet	Oui	Oui			Oui	Oui		
	Comité de gestion de plaintes du projet	- Plaintes liées au non-respect des engagements					Oui	Oui		Oui		
Niveau district	District	- Plaintes liées à l'utilisation des RN d'envergure inter-communale - Plaintes liées à la gouvernance se rapportant aux conflits d'intérêt d'utilisation de l'espace - Plaintes non résolues au niveau VOI, fokontany ou communal	Oui Transmission à CEEF ou DREEF pour BDD	- Inter-communal - District	Oui	Oui				Oui		

Niveau	Intervenants	Types de plaintes	Réception Accusé de réception	Localisation	Proposition de réponse Communication au plaignant	Mise en œuvre de la réponse					Clôture	Autres
						Actions directes	Evaluation approfondie	Recherche de solution (médiation arbitrage)	Retour d'information	Suivi de la mise en œuvre		
	CEEF	Plaintes liées à l'application des lois constatées par l'Agent forestier ou transmis au CEEF car non résolues au niveau local ou par le gestionnaire de projet	Oui Transmission à DREEF pour BDD	- Local - Communal - District	Oui							
	Gestionnaire de Projet	- Plaintes liées à l'application de la loi dans la ou les zones d'action du projet - Plaintes liées au non-respect des engagements	Oui Transmission à DREEF pour BDD	Site du projet	Oui	Oui			Oui		Oui	
	Comité de gestion de plaintes du projet						Oui	Oui		Oui		
Niveau régional	Région / Préfecture	- Plaintes liées à l'utilisation des RN d'envergure interdistrict - Plaintes liées à la gouvernance se rapportant aux conflits d'intérêt d'utilisation de l'espace	Oui Transmission à DREEF pour BDD	- Interdistrict	Oui	Oui	Coordination / Facilitation SLC	Coordination / Facilitation SLC	Oui	Coordination / Facilitation SLC	Oui	
	SLC (Région)	- Plaintes non résolues au niveau communal ou district		- Région - Gouvernance			Oui	Oui		Oui		

Niveau	Intervenants	Types de plaintes	Réception Accusé de réception	Localisation	Proposition de réponse Communication au plaignant	Mise en œuvre de la réponse					Clôture	Autres
						Actions directes	Evaluation approfondie	Recherche de solution (médiation arbitrage)	Retour d'information	Suivi de la mise en œuvre		
	DREEF	Plaintes liées à l'application des lois constatées par l'Agent forestier ou transmis au DREEF car non résolues au niveau local, CEEF ou par le gestionnaire de projet	Oui Transmission à BNCR pour BDD	Tous les niveaux (région et sous-région)	Oui							
	Plateforme régionale REDD+ ⁸⁸	- Plaintes liées à la mise en œuvre du programme REDD+ - Rétroaction (plaintes liées à la gouvernance, iniquité, liées au non-respect des engagements)	Oui Transmission à BNCR pour BDD et aux instances compétentes pour traitement	Zones de programme REDD+								
Niveau national	BNC REDD+	Rétroaction (plaintes liées à la gouvernance, iniquité, liées au non-respect des engagements)			Oui	Oui				Oui	Oui	Gestion BDD plaintes Transmission au gestionnaire du site web Transmission à l'Unité indépendante de Suivi - évaluation

⁸⁸ Plateforme régionale : Revoir par rapport à la mission qui leur sera attribuée

Niveau	Intervenants	Types de plaintes	Réception Accusé de réception	Localisation	Proposition de réponse Communication au plaignant	Mise en œuvre de la réponse					Clôture	Autres
						Actions directes	Evaluation approfondie	Recherche de solution (médiation arbitrage)	Retour d'information	Suivi de la mise en œuvre		
	Plateforme nationale REDD+	Plaintes liées à la mise en œuvre du programme REDD+ - Rétroaction (plaintes liées à la gouvernance, iniquité, liées au non-respect des engagements)	Oui Transmission à BNCR pour BDD et aux instances compétentes pour traitement									
	DGF / Directions		Oui Transmission à BNCR pour BDD		Oui	Oui	Coordination / Facilitation Comités intersectoriels	Coordination / Facilitation Comités intersectoriels	Oui	Coordination / Facilitation SLC	Oui	
	Comités intersectoriels					Oui	Oui	Oui				
	Gestionnaire d'autres programmes sectoriels	Plaintes liées à la mise en œuvre du programme REDD+		Zones du programme	Oui	Oui			Oui	Oui	Oui	
	Unité indépendante de Suivi-évaluation	Toutes catégories										

ANNEX VI – Carbon accounting

This annex provides additional information on carbon accounting

Annex VI.I - Operationalization of the forest definition

Operationalization of the forest definition

In terms of operationalizing the forest definition there are some aspects to clarify:

- **Canopy cover and minimum area thresholds:**
 - Activity Data: As explained in section 8.3, squared sampling units of 1 ha with a grid of 25 points are used for collecting the data. These two features are used to classify lands that have a 30% tree canopy cover and 1 ha of minimal area.
 - Emission Factor: Only plots included in forest areas or that even though they don't reach the thresholds within the plot, they are within a forested area, will be considered as forest.
- **Height:** The height threshold refers to the potentiality to reach this height in-situ. In case of no continuous disturbance⁸⁹, forest in the Eastern Humid Forest Ecoregion can reach the height in-situ. There are no formations that naturally cannot reach 5 meters.
- **Temporarily un-stocked forest:** According to the IPCC guidelines Forestland “also includes systems with vegetation that currently fall below, but are expected to exceed, the threshold of the forest land category”. This usually refers to areas under forest management that are harvested and post-harvesting regrowth is expected.
 - Forest management: In the ER program area, most of cleared areas as part of forest management occurs in plantations, which are generally Eucalyptus plantations. As explained earlier, commercial plantations are not included in this version of the ERPD.
 - Slash-and-burn agriculture: In the ER program area, most of deforestation occurs as a result of a slash-and-burn system called “Tavy” (See **Erreur ! Source du renvoi introuvable.**). Although vegetation could meet the forest thresholds during the fallow period (usually only in the first rotation), currently evidence shows that after the first cycle, additional cycles follow ending up in permanent conversion to shrubland or grassland. Moreover, experience shows that it would take 15-20 years in order to enable trees to reach the forest thresholds, so it is not expected that within the reference period cleared areas will be able to reach the minimum threshold. Based on this, the assumption made is once total clearing of vegetation is detected, this would constitute a deforestation.

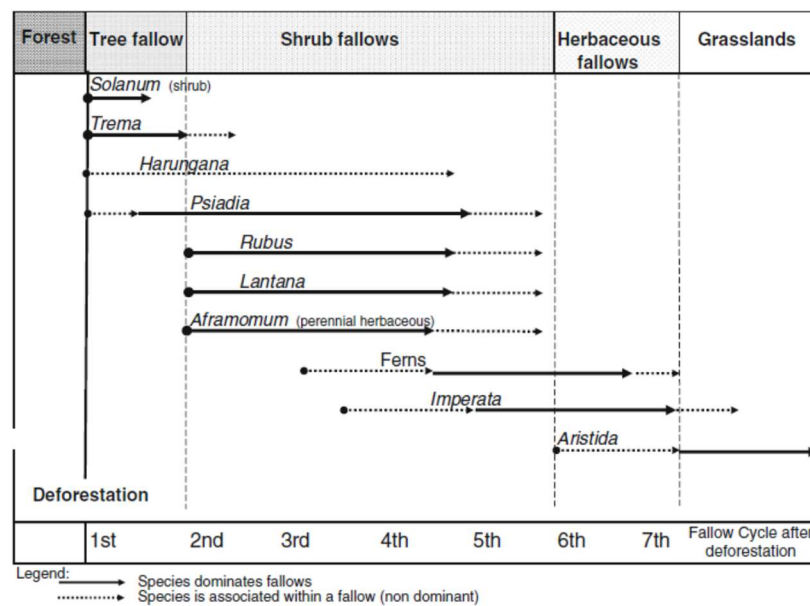
⁸⁹ These are of anthropogenic origin. Natural disturbances such as cyclones are disturbances that cause transient effects in the vegetation.

Box 2. The “Tavy” system.

The “Tavy” system

According to Andriamanjara et al. (2016): “In eastern Madagascar, traditional farming practices of slash and burn, in which the forest is replaced for agriculture by cutting and burning the trees followed by agricultural cycles interspersed with fallow periods, lead to vegetation changes marked by transition of primary forest to grassland (Styger et al., 2007).

The first fallow cycle after deforestation is associated with a tree fallow system where vegetation types are dominated by *Trema orientalis* and *Harungana madagascariensis*. From the second to the fifth fallow cycle after deforestation, endemic shrubs, dominated by *Psidia atlissima* and exotic and invasive species dominated by *Rubus moluccanus* or *Lantana camara*, replace the previous tree fallow species resulting in shrub fallow landscapes. Beyond the sixth fallow cycle herbaceous fallows or grasslands dominate, marked by development of grass species and ferns, *Imperata cylindrica*, and *Aristida* sp.⁹⁰⁹¹ (Styger et al., 2009; Styger et al., 2007)”.





- **Forest types:** In order to assign to different forest types, visual interpretation is used:
 - Activity Data: In terms of activity data, visual interpretation of very high resolution imagery is used. More information

⁹⁰ Styger, E., Rakotondramasy, H.M., Pfeffer, M.J., Erick, C.M., Fernandes, E.C.M., Bates, D.M., 2007. Influence of slash-and-burn farming practices on fallow succession and land degradation in the rainforest region of Madagascar. *Agric. Ecosyst. Environ.* 119 (3–4), 257–269.

⁹¹ Styger, E., Fernandes, E.C.M., Rakotondramasy, H.M., Rajaobelinirina, E., 2009. Degrading uplands in the rainforest region of Madagascar: fallow biomass, nutrient stocks, and soil nutrient availability. *Agrofor. Syst.* 77 (2), 107–122.

Table 33. Interpretation of different forest types

Class	Definition FRA
<i>Primary forest</i>	<p>In very high resolution imagery these are areas of high tree canopy cover, where the texture of the vegetation or the historical information does not show indications of disturbance.</p> 
<i>Modified Natural Forest</i>	<p>In very high resolution imagery these are areas of high canopy cover with indication of disturbances (i.e. <u>degraded forests</u>) or with medium tree canopy cover (i.e. <u>secondary forests</u>).</p> 

- Emission Factors: As explained in Section 8.3, emission factors were derived from the 2014 inventory of PERR-FH and the 2016 inventory by DVRF. The former targeted natural vegetation, mainly what is considered primary forest, so it was assumed that all sampling units were located in primary forest. The latter targeted secondary forests (Ravenala, Ravenala Mixte, Agroforestry, Savoka Vieux) and disturbed forests (single layer).

Operationalization of the definition of REDD+ activities

Since only deforestation and enhancement of carbon stocks in new forest are included, the operationalization of the forest definition was done in the following way:

- Deforestation:
 - Human-induced: Natural losses occurred due to cyclones, usually in top of ridges at high altitudes.
 - Minimum area: As explained in section 8.3, 1 ha squared sampling units are used to collect sample reference data together with a grid of 25 points. This has been used by interpreters in order to identify objects that would classify as forest.
 - Permanent vs temporal loss: It is unlikely that forest cover loss occurring within the 10-year reference period will reach the forest threshold, hence, it will be assumed that the

conversion has been permanent. If after 10 years' forest reconstitutes, this will be considered as a stock enhancement.

- Plantations: Conversion of plantations to non-forest has not been included in the RL.
- Forest degradation:
 - Conversion of primary forest to disturbed forest is mapped with very high resolution imagery. Disturbed forest is that forest that shows sign of disturbance or that it is near to areas deforested in the recent pas (100 meters).
 - Conversion of primary forest to agroforestry and plantations is mapped with very high resolution imagery.
- Enhancement of carbon stocks:
 - Minimum area: As explained in section 8.3, 1 ha squared sampling units are used to collect sample reference data together with a grid of 25 points. This has been used by interpreters in order to identify objects that would classify as forest.
 - Plantations: Conversion of non-forest to plantations has not been included in the RL.

Annex VI.II – Method used for calculating the average historical emissions

In accordance with the methodological framework, the ER Program was developed following the rules and methods proposed by the 2006 IPCC Good Practice Guidelines for National Greenhouse Gas Inventories. Annual GHG emissions or removals over the reference period in the Accounting Area (RL) are estimated as the sum of annual change in total carbon stocks over the reference period in the Accounting Area (ΔC_B) and the non-CO₂ GHG emissions (L_{fire}).

$$RL = \sum_t (\Delta C_B + L_{fire})$$

Reducing Emissions from Deforestation / Land Use Change of Forest Land to other Land

a. Changes in carbon stocks in biomass

Following the 2006 IPCC Guidelines, the annual change in carbon stocks in biomass on forestland converted to other land-use category (ΔC_B) would be estimated through the following equation:

$$\Delta C_B = \Delta C_G + \Delta C_{CONVERSION} - \Delta C_L \quad \text{Equation 3}$$

Where:

ΔC_B	Change of total carbon stocks during the reference period, in tC per hectare, per year.
ΔC_G	Annual increase in carbon stocks in biomass due to growth on land converted to another land-use category, in tC per hectare and year;
$\Delta C_{CONVERSION}$	Initial change in carbon stocks in biomass on land converted to other land-use category, in tC per hectare and year;
ΔC_L	Annual decrease in biomass carbon stocks due to losses from harvesting, fuel wood gathering and disturbances on land converted to other land-use category, in tC per

hectare and year.

Following the recommendations set in chapter 2.2.1 of the GFOI Methods Guidance Document for applying IPCC Guidelines and guidance in the context of REDD+, the above equation will be simplified and it will be assumed that:

- The annual change in carbon stocks in biomass (ΔC_B) is equal to the initial change in carbon stocks ($\Delta C_{CONVERSION}$);
- It is assumed that the biomass stocks immediately after conversion is the biomass stocks of the resulting land-use, so ΔC_G and ΔC_L are equal to zero.

Considering equation 2.16 of the 2006 IPCC GL for estimating $\Delta C_{CONVERSION}$ and considering 2.8 b for the estimation of carbon stocks, the change of biomass stocks could be expressed with the following equation.

$$\Delta C_B = \sum_{j,i} (AGB_{Before,j} \times (1 + R_j) - AGB_{After,i} \times (1 + R_i)) \times CF \times \frac{44}{12} \times A(j, i) \quad \text{Equation 4}$$

Where:

$A(j, i)$ Area of forest converted from forest to non forest during the reference period, in hectare per year. In this case, four possible conversions are possible:

- **Primary forest to non-forest (DPF);**
- **Disturbed Forest to Non-Forest (DDF)**
- **Secondary Forest to Non-Forest (DSF)**
- **Agroforestry to Non-Forest (DAF)**

$AGB_{Before,j}$ Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha. This can be the aboveground biomass of the following two types of forest:

- **Primary forest (PF);**
- **Disturbed Forest (DF);**
- **Secondary Forest (SF);**
- **Agroforestry (AF);**

R_j ratio of below-ground biomass to above-ground biomass for a specific vegetation type, in tonne d.m. below-ground biomass (tonne d.m. above-ground biomass)⁻¹. This is equal to:

- **0.2** is the default for tropical moist deciduous forest when aboveground biomass is <125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for Secondary Forest and Agroforestry.
- **0.24** is the default for tropical moist deciduous forest, >125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for primary forest and disturbed forest.

$AGB_{After,i}$ Aboveground biomass of non-forest type I after conversion, in tonnes dry matter per ha. This is the aboveground of **non-forest (NF)**.

R_i ratio of below-ground biomass to above-ground biomass for a specific vegetation type i, in tonne d.m. below-ground biomass (tonne d.m. above-ground biomass)⁻¹. This is equal to:

- **0.2** is the default for tropical moist deciduous forest when aboveground biomass is <125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for non-forest.

CF Carbon fraction of dry matter in tC per ton dry matter. The value used is:

- **0.47** is the default for tropical forest as per IPCC AFOLU guidelines 2006, table 4.3.

b. Changes in carbon stocks in Dead wood and Litter

Considering equation 2.23 of the 2006 IPCC GL for estimating ΔC_{DOM} , the change in dead organic matter carbon stocks could be expressed with the following equation.

$$\Delta C_{DOM} = \frac{(C_n - C_o) \times A(j, i) \times \frac{44}{12}}{T_{on}} \quad \text{Equation 5}$$

Where:

$A(j, i)$ area undergoing conversion from old to new land-use category, ha. This is the same as parameter $A(j, i)$ above.

C_o dead wood/litter stock, under the old land-use category, tonnes C ha⁻¹.

For dead wood it will have different values for each of the following forests:

- Primary forest (PF);
- Disturbed Forest (DF);
- Secondary Forest (SF);
- Agroforestry (AF);

For Litter, a default value for tropical broadleaf forests of **2.1 tC/ha** has been used. This has been sourced from 2006 IPCC GL, TABLE 2.2, Volume 4, Chapter 4.

C_n dead wood/litter stock, under the new land-use category, tonnes C ha⁻¹. It has been assumed that this is **zero**.

T_{on} time period of the transition from old to new land-use category, yr. The Tier 1 default is **1 year** for carbon losses, so it has been assumed one year.

44/12 Conversion of C to CO₂

c. Changes in Soil Organic Carbon

Since in the ER program area there are only mineral soils, considering equation 2.25 of the 2006 IPCC GL for estimating ΔC_{SOC} , the change in soil organic carbon could be expressed with the following equation.

$$\Delta C_{SOC} = \frac{\sum_{c,s,i} SOC_{REF_{c,s,i}} \times (1 - F_{LU_{c,s,i}} \times F_{MG_{c,s,i}} \times F_{I_{c,s,i}}) \times A_{c,s,i} \times \frac{44}{12}}{D} \quad \text{Equation 6}$$

Where:

A land area of the stratum being estimated, ha. All land in the stratum should have common biophysical conditions (i.e., climate and soil type) and management history over the inventory time period to be treated together for analytical purposes. This is the same as parameter $A(j, i)$ above.

SOC_{REF} the reference carbon stock, tonnes C ha⁻¹. In this case a value of **47 tC/ha** has been used. This is the default value for LAC soils in tropical moist climate as per the 2006 IPCC GL, TABLE 2.3, Volume 4, Chapter 2.

$F_{LU_{c,s,i}}$ stock change factor for land-use systems or sub-system for a particular land-use, dimensionless. In this case a default value of **0.82** for tropical moist climate and set aside <20 years has been assumed (c.f. 2006 IPCC GL, TABLE 5.5, Volume 4, Chapter 5). Most of

deforestation occurs due to the conversion to the “Tavy” agricultural system which has a fallow period which varies but rarely exceeds 20 years.

$F_{MG_{c,s,i}}$ stock change factor for management regime, dimensionless. In this case a default value of **1.22** for tropical moist climate and no tillage has been assumed (c.f. 2006 IPCC GL, TABLE 5.5, Volume 4, Chapter 5). Most of deforestation occurs due to the conversion to the “Tavy” agricultural system where soil disturbance by tillage is not important.

$F_{I_{c,s,i}}$ stock change factor for input of organic matter, dimensionless. stock change factor for management regime, dimensionless. In this case a default value of **0.92** for tropical moist climate and no inputs (c.f. 2006 IPCC GL, TABLE 5.5, Volume 4, Chapter 5). Most of deforestation occurs due to the conversion to the “Tavy” agricultural system which is a traditional system, very rudimentary, that does not have high inputs.

44/12 Conversion of C to CO2

d. Non-CO2 emissions from deforestation

Following the Equation 2.27 of Volume 4 of the 2006 IPCC GL, GHG emissions from forest fires are estimated with the following equation:

$$L_{fire} = A \times M_B \times C_f \times G_{ef} \times 10^{-3} \quad \text{Equation 7}$$

Where

A area burnt, ha, which is equivalent to $A(j, i)$ Area of forest converted from forest to non forest during the reference period, in hectare per year. This could be the following two conversions:

- **Primary forest to non-forest (DPF);**
- **Disturbed Forest to Non-Forest (DDF)**
- **Secondary Forest to Non-Forest (DSF)**
- **Agroforestry to Non-Forest (DAF)**

M_B mass of fuel available for combustion, tonnes ha-1. This is equivalent to the biomass prior to conversion AGB_j . This is the aboveground biomass in forest areas as afforestation/reforestation does not involve burning prior to conversion.

C_f combustion factor, dimensionless. This is equal to:

- **0.32** for primary forest, as it is the value for primary tropical forest (slash and burn) according to 2006 IPCC GL Table 2.6
- **0.5** for modified natural forest, as it is the value for secondary tropical forest (slash and burn) according to 2006 IPCC GL Table 2.6

G_{ef} emission factor, g kg-1 dry matter burnt. This is equal to:

- **6.8** for CH4 as it is the value for tropical forest according to 2006 IPCC GL Table 2.6
- **0.2** for N2O as it is the value for tropical forest according to 2006 IPCC GL Table 2.6

In order to convert these GHG emissions to tCO2e, GHG emissions from CH4 and N2O are multiplied by the Global Warming Potential for both gases (GWP), so the equation would be as follows:

$$L_{fire} = A(j, i) \times AGB_{Before,j} \times C_f \times (G_{ef_{CH4}} \times GWP_{CH4} + G_{ef_{N2O}} \times GWP_{N2O}) \times 10^{-3} \quad \text{Equation 8}$$

Where

GWP_{CH4} Global Warming Potential of CH4, = 24

From the above, the only parameters that are not default values and that are measured are the following:

Table 34. Parameters for estimation of carbon stock changes from deforestation

	Activity Data
$A(j, i)$	Annual conversion from forest type j (primary forest, modified natural forest), to non-Forest Land uses i (Non-Forest)
$AGB_{Before,j}$	Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;
$AGB_{After,i}$	Aboveground biomass of non-forest type I after conversion, in tonnes dry matter per ha;
C_o	dead wood/litter stock, under the old land-use category, tonnes C ha ⁻¹ .

Reducing Emissions from Degradation / Forest Land remaining Forest Land

Following the recommendations set in chapter 3.1.2 of the GFOI Methods Guidance Document, GHG emissions from degradation will be estimated by taking “account of long-term reductions of carbon densities due to transitions between forest strata and sub-strata, and within the strata and substrata affected by human activity (i.e. MNF and planted forests)”. In essence this means, by multiplying activity data of transition between different types of forest by the difference in average carbon stocks.

Considering equation 2.16 of the 2006 IPCC GL for estimating $\Delta C_{CONVERSION}$ and considering 2.8 b for the estimation of carbon stocks, the change of biomass stocks could be expressed with the following equation.

$$\Delta C_B = \sum_{j,i} (AGB_{Before,j} \chi(1 + R_j) - AGB_{After,i} \chi(1 + R_i)) \times CF \times \frac{44}{12} \times A(j, i) \quad \text{Equation 9}$$

Where:

$A(j, i)$ Area of forest converted from primary forest to modified natural forest – disturbed forest or to plantation during the reference period, in hectare per year.

$AGB_{Before,j}$ Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha. This is the aboveground biomass of **Primary forest (PF)**;

R_j ratio of below-ground biomass to above-ground biomass for a specific vegetation type, in tonne d.m. below-ground biomass (tonne d.m. above-ground biomass)⁻¹. This is equal to:

- **0.24** is the default for tropical moist deciduous forest, >125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for primary forest and disturbed forest.

$AGB_{After,i}$ Aboveground biomass of non-forest type I after conversion, in tonnes dry matter per ha. This is the aboveground of **Disturbed Forest (DF)** or **Plantation (PL)**;

R_i ratio of below-ground biomass to above-ground biomass for a specific vegetation type i, in tonne d.m. below-ground biomass (tonne d.m. above-ground biomass)⁻¹. This is equal to:

- **0.24** is the default for tropical moist deciduous forest, >125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for primary forest

and disturbed forest.

- **0.2** is the default for tropical moist deciduous forest when aboveground biomass is <125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for Agroforestry.

CF Carbon fraction of dry matter in tC per ton dry matter. The value used is:

- **0.47** is the default for tropical forest as per IPCC AFOLU guidelines 2006, table 4.3.

44/12 Conversion of C to CO₂

From the above, the only parameters that are not default values and that are measured are the following:

Table 35. Parameters for estimation of carbon stock changes from degradation

	Activity Data
$A(j, i)$	Annual conversion from forest type j (primary forest), to Forest type i (modified natural forest or plantations)
$AGB_{Before,j}$	Aboveground biomass of forest type j before conversion, in tonne of dry matter per ha;
$AGB_{After,i}$	Aboveground biomass of forest type I after conversion, in tonnes dry matter per ha;

Enhancement of carbon stocks in new forests / Land Use Change from non-Forest Land to Forest

Following the recommendations set in chapter 3.1.4 of the GFOI Methods Guidance Document, enhancement of carbon stocks in afforestation/reforestation will be estimated by multiplying the activity data by the yield tables or growth curves in the generation of changes in carbon density through time on afforested/reforested lands. Since there are no such tables in Madagascar in regenerated forest, it will be assumed that afforested/reforested lands take 15 years to reach the status of Modified Natural Forest (i.e. secondary forest). This is seen as a better option than using averages, which is the alternative proposed in Chapter 3.14 of GFOI which would be a source of bias.

Therefore, the annual change in carbon stocks would be estimated as follows:

$$\Delta C_B = \sum_{j,i} \frac{(AGB_{Before,i} - AGB_{After,j})}{\text{Years growth}} \times (1 + R) \times CF \times \frac{44}{12} \times A(i, j) \quad \text{Equation 10}$$

Where:

ΔC_B Change of total carbon stocks during the reference period, in tC per hectare, per year.

$A(j, i)$ Annual conversion from non-Forest Land use i to forest type j (planted forest or modified natural forest). Area of forest converted from non-forest to forest during the reference period, in hectare per year. In this case, it would be :

- **Non-forest to Secondary Forest**
- **Non-Forest to forestry**

$AGB_{Before,i}$ Aboveground biomass of non-forest type i before conversion, in tonnes dry matter per ha. In this case, it would be the aboveground biomass of **non-forest (NF)**.

$AGB_{After,j}$ Aboveground biomass of forest type j after conversion, in tonne of dry matter per ha. In

this case, it would be the aboveground biomass of :

- **Secondary Forest (SF);**
- **Agroforestry (AF);**

R ratio of below-ground biomass to above-ground biomass for a specific vegetation type *i*, in tonne d.m. below-ground biomass (tonne d.m. above-ground biomass)⁻¹. This is equal to:

- **0.2** is the default for tropical moist deciduous forest when aboveground biomass is <125 t.d.m./ha according to 2006 IPCC GL, TABLE 4.4, Volume 4, Chapter 4. This is the case for Secondary Forest and non-forest.

Years growth Number of years to transit from Non-forest to forest. The value used is:

- **15** years is assumed as the secondary forest is assumed to have 20 years in average and the savouka jeune or non-forest represents a secondary vegetation of 5 years in average.

CF Carbon fraction of dry matter in tC per ton dry matter. The value used is:

- **0.47** is the default for tropical forest as per IPCC AFOLU guidelines 2006, table 4.3.

44/12 Conversion of C to CO2

From the above, the only parameters that are not default values and that are measured are the following:

Table 36. Parameters to estimate the changes in carbon stocks from afforestation reforestation

	Activity Data
$A(i, j)$	Annual conversion from non-Forest Land use <i>i</i> to forest type <i>j</i> (planted forest or modified natural forest)
$AGB_{Before,i}$	Aboveground biomass of non-forest type <i>j</i> before conversion, in tonne of dry matter per ha;
$AGB_{After,j}$	Aboveground biomass of forest type <i>i</i> after conversion, in tonnes dry matter per ha;

Annex VI.III – Methodology for the production of the forest cover maps

Report may be found in the following link:
https://www.dropbox.com/s/zya5npqk4umg6u9/Final_report_170620.pdf?dl=0

ANNEX VII – NATIONAL LAW AND REGULATORY TEXTS LINKED TO SAFEGUARDS

PRINCIPES pour Madagascar	TEXTES ET LOIS REGISSANT
<p>a) Les activités REDD+ sont cohérentes avec les programmes forestiers nationaux, complètent les objectifs de la politique forestière, tiennent compte des dina, des législations nationales et des conventions et accords internationaux et contribuent au développement durable au sens large</p>	<p>Secteur environnement</p> <p>Charte de l’environnement actualisée, loi n° 2015-003: fixe les règles de gestion de l’environnement en reconnaissant le rôle important de la biodiversité unique et des ressources naturelles de Madagascar, pose le principe de participation du public, le droit pour chaque individu d’accéder aux informations, priorise notamment les activités de restauration des habitats écologiques dégradés, de lutte contre les feux, lutte contre la conversion des forêts en terrains agricoles, de reboisement, etc.</p> <p>Code de gestion des Aires protégées (loi COAP n° 2005-005) : prévoit l’adoption de mesures de sauvegarde ou d’activités alternatives génératrices de revenus compensant les restrictions au droit de propriété ou au droit d’usage</p> <p>Secteur forêt</p> <p>Le décret n° 98-782 (exploitation forestière) exige des plans d’aménagement pour assurer la gestion durable des forêts et une étude d’impact environnemental pour toute activité à caractère économique entreprise dans les forêts</p> <p>Secteur agriculture et élevage</p> <p>L’Ordonnance n° 62-123 sur le classement en zone à vocation forestière, pastorale ou agricole des terres de Madagascar prévoit l’interdiction de la divagation et le pacage des animaux que dans les zones classées à vocation forestière ou de protection.</p> <p>L’Ordonnance n° 60-127 fixant le régime des défrichements et des feux de végétation interdit tous défrichements à l’intérieur du domaine forestier national et des zones en défens.</p> <p>Secteur foncier et aménagement du territoire</p> <p>Loi n° 2015-051 portant orientation de l’Aménagement du Territoire pose le principe de responsabilité de l’Etat, des Provinces, des Régions et des Communes dans la mise en valeur du territoire et le développement équilibré du territoire.</p> <p>La loi Foncière n° 2005-019 prévoit dans son article 38 des régimes spécifiques pour des aires qui seront soumises à un dispositif juridique particulier</p> <p>Secteur mines</p> <p>La Loi n° 99-022 portant Code minier dispose que le Ministère chargé des Mines et le Ministère chargé de l’Environnement veillent au respect des règles visant à la protection environnementale par les titulaires de permis miniers.</p>

	<p>Loi MECIE Le décret MECIE stipule que l'exécution du PGEP consiste en l'application par le promoteur des mesures prescrites pour supprimer, réduire et éventuellement compenser les conséquences dommageables sur l'environnement.</p> <p>Secteur énergies La loi n° 98-029 portant Code de l'Eau prévoit que la protection des forêts naturelles ou des forêts de reboisement est soumise aux dispositions prévues par la loi n° 97-017 du 16 Juillet 1997, et celles portant sur le régime des défrichements et des feux de végétation.</p> <p>Secteur GIZC Décret n° 2010-137 : prise en compte dans tout projet de développement et d'aménagement de la conservation de l'intégrité écologique des écosystèmes côtiers</p>
<p>b) Les structures nationales de gouvernance forestière sont transparentes et efficaces et tiennent compte de la législation et de la souveraineté nationale; La stratégie nationale REDD+ contribue à la transparence et l'efficacité des structures nationales de gouvernance forestière tenant compte de la législation et de la souveraineté nationale</p>	<p>Secteur environnement La loi n° 2015-003 consacre la notion de Gouvernance environnementale qui respecte l'égalité de traitement des acteurs, l'équité et la transparence Le COAP loi n° 2005-005 prévoit des types de gouvernance répondant aux pratiques nationales et internationales des ressources naturelles (la gouvernance publique, la gouvernance partagée ou cogestion, la gouvernance privée et la gouvernance communautaire)</p> <p>Secteur forêt Absence de dispositions prônant les principales de bonne gouvernance (transparence, redevabilité) dans les législations et réglementations forestières actuelles.</p> <p><i>Propositions :</i> Elaborer ou améliorer les dispositions juridiques sectorielles dans la prévention des conflits d'intérêts et des cas de corruption qui peuvent constituer des blocages dans le cadre de la préparation à la REDD+ et de la mise en œuvre de sa politique.</p> <p>Secteur Foncier et aménagement du territoire L'aménagement du territoire revêt une dimension transversale incluant la gestion foncière, l'environnement, l'exploitation minière, etc.</p> <p>Agriculture et élevage Absence de mention dans les textes. Proposition : Instaurer et préciser les principes de bonne gouvernance environnementale prévus dans la PGE et les politiques environnementales dans les législations forestières et sectorielles</p> <p>Secteur mines</p>

	<p>Code minier et décret d'application associent les Collectivités Territoriales Décentralisées (Provinces Autonomes, Régions, Communes) en leur donnant des compétences spécifiques dans la gestion des activités minières jusqu'au niveau local.</p> <p>Secteur MECIE L'Arrêté n° 6830/2001 régit les procédures de participation du public à l'évaluation environnementale qui consacre le droit à l'information.</p> <p>Secteur énergie Absence de mention dans les textes. Proposition : Instaurer et préciser les principes de bonne gouvernance environnementale prévus dans la PGE et les politiques environnementales dans les législations forestières et sectorielles</p> <p>Secteur GIZC Décret 2010-137, qui vise l'amélioration des processus de gouvernance en les rendant plus équitables, transparents et dynamiques, par et pour le bénéfice des communautés et de la nation.</p>
<p>c) Le programme REDD+ reconnaît et respecte les connaissances et les droits aux terres et aux ressources des communautés locales et évalue les effets négatifs potentiels sur leurs conditions de vie à long terme et atténue ces effets s'il y a lieu en veillant à la justice sociale</p>	<p>Secteur environnement La Charte de l'Environnement assure la protection du bien-être socio-économique des communautés de base dans la gestion des ressources naturelles, le développement socioculturel et économique dans le but d'obtenir la synergie entre les coutumes et tradition et le développement de la science et de la technologie Le COAP prévoit que les règles de gestion de l'AP doivent faire prévaloir, autant que possible, le respect des normes et des pratiques traditionnelles (Dina, fady, lieux sacrés forestiers, aquatiques ou autres) observées par les communautés locales concernées.</p> <p>Secteur forêt La loi n° 97-017 autorise les membres du Fokonolona à exercer leurs droits d'usage traditionnels individuellement ou collectivement dans les forêts. Le décret GCF n° 2001-122 prévoit la gestion des droits d'usage individuellement ou collectivement par les membres de la communauté de base.</p> <p>Secteur Foncier et aménagement du territoire La loi foncière n° 2005-019 fixe le régime juridique de la propriété foncière privée non titrée (PPNT), applicable à l'ensemble des terrains, urbains comme ruraux appropriés selon les coutumes et les usages du moment et du lieu.</p> <p>Agriculture et élevage L'Ordonnance n° 62-123 sur le classement en zone à vocation forestière, pastorale ou agricole interdit la divagation et le pacage des animaux dans les zones classées à vocation forestière ou de protection, et l'Ordonnance n° 60-127 fixant le régime des</p>

	<p>défrichements et des feux de végétation</p> <p>Secteur mines Le Code minier et son décret d'application prévoit la protection des de propriétés closes de murs, village, groupe d'habitations, puits et sources, édifices religieux, lieux de sépulture et lieux considérés comme sacrés ou tabous sans le consentement écrit du propriétaire, ou des autorités administratives locales</p> <p><u>Secteur MECIE</u> Il prévoit le recueil des avis de la population affectée.</p> <p>Secteur énergie Le décret n° 2003-942 relatif à l'utilisation hydroélectrique de l'eau détaille les obligations des concessionnaires dans la protection des sites et des paysages.</p> <p>Secteur GIZC Le décret N°2010-137 reconnaît les connaissances écologiques traditionnelles des populations côtières et leur rôle dans la conservation et la pérennité des zones côtières et marines</p>
<p>d) Toutes les parties prenantes en particulier les communautés locales et les détenteurs de droits aux terres et aux ressources participent pleinement et efficacement aux activités REDD+ avec leur consentement libre, informé et préalable</p>	<p>Secteur environnement La Charte de l'Environnement associe l'Etat, les Collectivités territoriales décentralisées avec les concours des communes et du population locales, la société civile, les communautés locales, le secteur privé et tous les citoyens, pour une gestion pérenne de l'environnement et de ses services. Le COAP prévoit la prise en compte des avis du public au niveau local et régional, notamment dans l'élaboration des plans de gestion, et les avis de l'administration au niveau régional et national pour sa validation.</p> <p>Secteur forêt La loi n° 96-025 sur le transfert de gestion des ressources naturelles renouvelables permet de confier aux Communautés de base (COBA) la gestion de ces ressources qui sont comprises dans les limites de leur terroir. La loi n° 97-017 portant révision de la législation forestière prévoit la participation effective des Fokonolona à la conservation durable des ressources naturelles renouvelables (droits d'usage). Le décret n° 98-782 prévoit que l'administration forestière consulte et associe les parties prenantes y compris populations riveraines concernées au processus de décisions relatives à la gestion forestière. Le décret n° 2005-849 prévoit que la Commission forestière est constituée d'un échantillon représentatif des parties prenantes du secteur forestier.</p> <p>Secteur Foncier et aménagement du territoire La loi sur l'Aménagement du territoire prévoit la participation de toutes les parties</p>

	<p>prenantes à la prise des décisions en matière d'aménagement du territoire ainsi qu'à sa mise en oeuvre et à son évaluation.</p> <p>Agriculture et élevage L'Ordonnance n° 60-127 prescrit que les communes rurales ou collectivités rurales coutumières ou de droit exercent la surveillance des défrichements et des feux de végétation</p> <p>Secteur mines Participation des parties prenantes non prévue. A insérer dans le nouveau code minier</p> <p>Secteur MECIE Il est dit que la consultation du publique soit fait sur place et les résultats seront intégré dans l'EIE</p> <p>Secteur énergie Le décret n° 2003-942 relatif à l'utilisation hydroelectrique de l'eau dispose que la concession et l'autorisation font l'objet, au préalable, d'étude d'impact environnemental</p> <p>Secteur GIZC Décret n° 2010-137 implique un partage des responsabilités, prises individuellement et/ou collectivement dans la gestion marine et côtière.</p>
<p>e) La stratégie REDD+ protège les forêts naturelles contre la dégradation ou leur conversion, accroît les avantages qu'offre la conservation de la biodiversité et des services écosystémiques, et améliore la sécurité des moyens de subsistance et le bien-être à long terme des communautés locales en accordant une attention spéciale aux femmes et aux personnes les plus marginalisées et/ou vulnérables</p>	<p>Secteur environnement</p> <ul style="list-style-type: none"> - La Charte précise d'améliorer et renforcer la gouvernance des filières bois, espèces faunistiques et floristiques de Madagascar pour préserver au mieux la biodiversité et limiter l'illégalité notamment dans les régions productrices. - Le COAP prévoit l'adoption de mesures de sauvegarde ou d'activités alternatives génératrices de revenus pour les diverses parties prenantes compensant les restrictions au droit de propriété ou au droit d'usage induites par la constitution et les mesures de gestion d'une AP. <p>Secteur forêt</p> <ul style="list-style-type: none"> - La loi n° 97-017 prévoit que les réserves naturelles intégrales, les parcs nationaux, les réserves spéciales et les forêts classées, dans le respect des conventions internationales, ne sont pas susceptibles de distraction au régime forestier - Le décret GCF n° 2001-122 dispose que l'exploitation desdites ressources ne doit pas porter atteinte à la capacité productive ou reproductive de la forêt à la biodiversité. <p>Secteur Foncier et aménagement du territoire La loi n° 2015-051 portant Orientation de l'Aménagement du territoire pose le principe :</p> <p>→ de réserver à l'agriculture suffisamment de bonnes terres cultivables, en particulier, des surfaces d'assolement;</p>

- de procéder à l'identification des actions prioritaires pour le remodelage du territoire national;
- de veiller à ce que les aménagements pris isolément ou dans leur ensemble ainsi que les installations s'intègrent dans le paysage;
- de maintenir la forêt dans ses diverses fonctions.

Agriculture et élevage

- L'Ordonnance n° 62-123 prévoit que dans les zones classées à vocation forestière ou de protection, la divagation et le pacage des animaux sont et demeurent interdits.
- L'Ordonnance n° 60-127 prescrit que les communes rurales ou collectivités rurales coutumières ou de droit exercent la surveillance des défrichements et des feux de végétation commis sur toute l'étendue et au voisinage des terres de leur faritany traditionnel ou de droit, y compris celles qui font l'objet d'un titre d'occupation temporaire, ainsi que sur les terres qui font l'objet d'un titre définitif de propriété.

Secteur mines

- Le Code minier oblige l'exploitant minier de prendre les mesures de protection nécessaires pour minimiser et réparer tout dommage pouvant résulter des travaux conduits dans le cadre des activités minières.
- L'exploitant minier est responsable de toute dégradation de l'environnement du fait de ses travaux.
- Cette responsabilité n'est limitée que dans la mesure où il exerce dans le respect des lois et règlements régissant les activités minières ainsi que ceux visant à la protection de l'environnement.

Secteur MECIE

- Les projets d'investissements publics ou privés, qu'ils soient soumis ou non à autorisation ou à approbation d'une autorité administrative, ou qu'ils soient susceptibles de porter atteinte à l'environnement doivent faire l'objet d'une étude d'impact.

Secteur énergie

- La loi n° 98-032 portant réforme du secteur de l'électricité impose le respect des législations en matière de protection de l'environnement.
- Le Code de l'Eau pose le principe de renforcement de la lutte contre la pollution des eaux, l'articulation des règles de protection et de mise en valeur des ressources en eau avec les normes environnementales, le principe de pollueur payeur.
- Le décret n° 2001 – 173 stipule que la construction, l'exploitation et l'entretien des Installations sont soumises à des règles administratives, des normes techniques et à des réglementations de sécurité, de protection de l'environnement et des populations sur toute l'étendue du territoire de la République de Madagascar.

Secteur GIZC

Décret 2010-137:

- Améliorer la qualité environnementale, afin de s'assurer du maintien ou de la

	<p>restauration, de la promotion de la diversité économique, sociale et écologique, ainsi que de la productivité d'une zone donnée.</p> <ul style="list-style-type: none"> - Les actions de gestion, d'exploitation des ressources des milieux marins et côtiers doivent être entreprises en tenant compte des interrelations au sein et entre les écosystèmes constitutifs de cet ensemble terre-mer, dont l'homme est partie intégrante.
<p>f) Des mesures visant à prendre en compte les risques d'inversion sont mises en œuvre notamment le partage équitable des avantages du programme des activités REDD+ entre tous les détenteurs des droits et parties prenantes pertinentes (voir mécanisme de partage des avantages)</p>	<p>On constate l'absence des deux dernières garanties de Cancun dans la législation nationale Malagasy. Ce vide juridique peut impacter sur la mise en place du programme REDD+ à Madagascar.</p> <p>Propositions:</p> <ul style="list-style-type: none"> - Procéder à des réformes juridiques ou réglementaires pour résoudre les problèmes systémiques en vue d'assurer le bon suivi du bois récolté légalement, et remédier aux lacunes en matière de données, le blanchiment des permis et le manque de données cohérentes nécessaires au suivi des permis.
<p>g) Des mesures visant à réduire les déplacements d'émissions sont prises</p>	<ul style="list-style-type: none"> - Introduire ces deux garanties dans l'ordonnancement juridique des secteurs concernés par la REDD+ (Environnement, Forêt, Aires protégées)

