Forest Carbon Partnership Facility

(FCPF)

READINESS PREPARATION PROPOSAL (R-PP)

MADAGASCAR

Version of 08/10/10

Warning :

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This working version of the R-PP will be finalized in November 2010 after integration of all final comments, including those from the FCPF assessment and funding process

The original and reference version of the R-PP is in French. Reference must be made to the original version in case of debatable interpretation around the English version

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ACRONYMS

AFR	REDD+ Trust Agency
AND	Designated National Authority
ANDEA	National Authority for Water and Sanitation
BDSN	National Statistics Database
BER	REDD+ Executive Office
C3EDM	Center for Economic and Ethics Studies for the Development of Madagascar
CAZ	Ankeniheny – Zahamena Corridor
CBD	Convention on Biological Diversity
CI	Conservation International
CIME	Inter-ministerial Committee on the Environment
CIMF	Mining-Forest Inter-ministerial Committee
COBA	Local Communities
COS	Wood for construction and services
CPGU	Emergency Prevention and Management Unit
CSA	Center for Agricultural Services
CTE	Technical Assessment Committee
DEAP	Entrance fee in protected areas
DGF	Directorate-General Forests
EIA	Environmental Impact Assessment
ESSA-Forêts	School of Agronomy Sciences – Forest Department
FAO	Food and Agriculture Organization
FAPBM	Foundation for Protected Areas and Biodiversity of Madagascar
FCPF	Forest Carbon Partnership Facility
FOFIFA	Center for agricultural research
FORECA	Forests projects involved as carbon pools
FTM	Mapping Institute of Madagascar
GCF	Contractual Management of Forests
GELOSE	Secured Local Management
GHG	Greenhouse gases
GIRE	Integrated Management of Water Resources
GIZC	Integrated Management of Coastal Areas
IEFN	National Forest Ecological Inventory
INSTAT	National Statistics Institute
IOGA	Geophysics Institute and Observatory of Antananarivo
IPCC	Intergovernmental Panel on Climate Change
KOLOALA	Sites for forests resources sustainable management
KOLOHARENA	Platform of community associations and organizations
LRI/IRD	Laboratory of Isotopes Radio/Institute for Development Research
MAP	Madagascar Action Plan
MARP	Method for Participatory Rural Approach
MECIE	Environmental Compliance of Investments

MEF	Ministry of Environment and Forests
MEM	Ministry of Energy and Mining (currently Ministry of Mining and Hydrocarbons)
MNP	Madagascar National Parks
MRV	Monitoring - Reporting – Verification
NGO	Non-governmental Organization
ONE	National Environmental Office
ONESF	National Observatory on the Environment and the Forestry Sector
PADR	Action Plan on Rural Development
PAE	Environmental Action Plan
PAG	Forest and General Management Plan
PASR	Populations affected by the REDD+ strategy
PCP-REDD+	Platform for the coordination of REDD+ readiness
PGM-E	German-Malagasy Program on the Environment
PHCF	Holistic Program on Forest Conservation
PLOF	Local Tenure Plan
PNAT	National Land Planning Program
PNEBE	National Energy and Firewood Plan
PRPSE	Regional Planning and Monitoring and Evaluation Platform
RBG	Royal Botanical Garden, Kew
REDD	Reduction of Emissions from Deforestation and Forest Degradation
REDD+	Reduction of Emissions from Deforestation and Forest Degradation plus conservation, sustainable management of forests and enhancement of forest carbon stocks
ROR	Rural Observatories Network
R-PIN	Readiness Project Idea Note
R-PP	Readiness Preparation Proposal
SAPM	System of Protected Areas in Madagascar
SAVA	Sambava, Andapa, Vohémar, Ambilobe Region
SEAS-OI	Surveillance de l'Environnement Assistée par Satellite - Océan Indien
SESA	Strategic Environmental and Social Assessment
SESMP	Strategic Environmental and Social Management Plan
SIF	Platform on Tenure Security
SIRSA	Rural Information Systems for Food Security
SRAT	Regional Territorial Planning Framework
SWAp	Sectoral Wide Approach
TBE	Tableau de Bord Environnemental – Environmental Dashboard
TBS	Tableau de Bord Social – Social Dashboard
ToR	Terms of reference
U-REDD	REDD+ Unit
USAID	United States Agency for International Development
VOI / COBA	Local Communities

GENERAL INFORMATION

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EXECUTIVE SUMMARY

About R-PP and the Development Process

The Readiness Preparation Proposal (R-PP) is the roadmap for Madagascar for its readiness for REDD+. The R-PP is a national document as it is fully endorsed by the Government of Madagascar with a clear awareness that this document reflects the country's commitment over several years. It will be submitted to the FCPF Participants Committee in November 2010.

The R-PP presents the readiness approaches, mechanisms, and phases for the next three years. It does not include the country's REDD+ strategy but only the ways to finalize it. Strategy options and directions presented here serve as a basis for more thorough analyses, widened consultations, and actual negotiations with all stakeholders affected and interested by and relevant for REDD+.

Development of this document has been mandated to CT-REDD under the authority of the Ministry for Environment and Forests. The process is based on a participatory approach and benefited from contributions of all stakeholders at national and regional levels and of all land-use related sectors (Agriculture, Livestock, Energy, Mining, Transportation, Land Planning, etc.). Regional consultations were held in 8 regions with a high level of deforestation and representing all ecosystem types of Madagascar; local communities managing natural resources and populations living near forests represented the majority of the 350 participants to these regional consultations. Members of the civil society, the private sector, the academic and research community as well as technical and financial partners were also asked to provide their opinions and concerns on REDD+ and to recommend solutions to address deforestation and forest degradation.

The content of this document was thoroughly revised based on comments and suggestions by the Technical Advisory Panel (TAP) and the FCPF Participants Committee during its fifth meeting in March 2010.

Recommendations on activities, approaches and methodologies, key principles, strategy options and institutional arrangement for readiness management were approved by the stakeholders at the national validation workshop of July 19, 2010 in Antananarivo. This workshop gathered over a hundred participants from the capital city and the regions. They represented all stakeholders previously consulted: authorities, civil society including local communities, the private sector, and partners.

On the significance of forests in Madagascar

Madagascar is known as a "nature sanctuary": with a biological diversity with a rate of endemism of 80%, the island is home to more than 9,700 plants and 770 vertebrates, with the major part in forests. These forests might have lost half of their surface during the second part of the 20th century, due to population growth and agricultural clearing, while remaining the main source of household energy.

From the 1990s, beginning at the Rio Summit on Sustainable Development, Madagascar has demonstrated a political will to focus on environment and forests under its development strategy. The island is one of the world's 25 biodiversity hotspots. Its environmental program, with the objective of preserving natural resources for sustainable economic growth, has received the support of technical and financial partners with a contribution of over US$400 million over 20 years. One of the main results is the creation of 2.65 million hectares of protected areas, and the ongoing process to establish 3.25 million hectares of new protected areas, to amount to a total of 10% of the country's surface. This program also helped reduce deforestation by 75% (from 2% to 0.5% each year).

On the role of REDD+ for natural resources conservation

Madagascar is currently developing its arrangement to sustain and enhance conservation of its natural resources, along with economic incentives. The REDD+ mechanism is viewed as a future pillar, similar to the creation of the Biodiversity Foundation which will mobilize over US$ 50 million. Since 2001,

Madagascar has implemented 5 REDD+ and methodology development projects covering its various ecosystems. Pilot sales of carbon on the voluntary market have been initiated since 2006, demonstrating the dynamism and the willingness of the country to prepare for this mechanism. Lessons learned from the pilot projects are applied in this R-PP.

On the causes of deforestation and forest degradation

Madagascar wants to reduce deforestation even more, and wishes to stabilize the degradation of forests, which had never been accurately estimated. Thanks to an experience of 20 years with the Environmental Program, the main causes for the annual loss of 50,000 hectares are forests are - (i) forest conversion for agriculture, (ii) harvesting of firewood, and (iii) expansion of legal or illegal small-scale mining. There are several underlying factors to deforestation: unsustainable agricultural practices, unstable livelihoods for households, unevenly distributed population growth and concentration, and lack of incentives for the sustainable use of resources. Madagascar would like to implement radical measures against the following potential causes: unsustainable logging, harvesting of firewood associated with inefficient carbonization techniques, and forest pastures. From the lessons learned from the current illegal logging of precious woods, inadequacies of forest governance should be specifically addressed and is a preliminary condition for the implementation of REDD+ strategies.

On REDD+ strategy options

Three strategy options will be developed for the implementation of REDD+:

- Improvement of governance in the forest sector;
- Management of access to forest areas;
- The development of alternatives to deforestation and forest degradation.

Intervention directions suggested under each option provide directions to address the direct and underlying causes of deforestation and forest degradation. Outcomes will confirm and refine options or develop new options as well as concrete short- and medium-term measures.

On the steps for REDD+ readiness

According to planning, Madagascar should be ready for the REDD+ mechanism at the end of the third year of preparation. Strategies will be developed and required technical tools will be in place.

The strategy development process will take 3 years, based on 5 main steps:

- Following a wide information dissemination process, a thorough and spatialized analysis of root causes of deforestation will be performed for a representative sample of 12 regions in 7 ecosystems, during the first 6 months;
- Initial strategy options will then be refined through 6 main assessments. In coordination with all stakeholders, and notably the relevant sectors associated to the decision-making process, the best combination of intervention directions will be defined to establish several scenarios. These scenarios will be subjected to negotiations and consultations at all levels. Selection criteria will focus on effectiveness, efficiency, and equity. Positive impacts on deforestation and biodiversity preservation will also be maximized.
  Under this R-PP, the country has chosen to focus on a national REDD+ approach with a strong anchor at local level through a spatialized approach. Implementation will be gradual to allow enough time to develop the various facilities and reforms and most importantly, avoiding negative effects on the commitments and outcomes of pilot projects. At the end of the second year, a national policy and regulation strategy, do be refined in interregional spatialized strategies, will be developed for a short to medium-term operation.
- Strategic environmental and social assessments will be developed in a participatory way, then implemented, to assess the REDD+ national strategy.
- Along with the development of these strategies, the global implementation framework will be assessed with 5 studies. This framework, to be negotiated with all stakeholders, will better align policies and secure implementation of strategies. It will mainly focus on the following areas: (i) Inter-sectoral coordination, (ii) spatialized approach and monitoring, (iii) forest carbon ownership, (iv) funding

allocation to implement REDD+, and (v) management and sharing of carbon revenues.

Development of technical tools to support the REDD+ mechanism will be spread over 3 years, followed by another year of refinement:

- For the development of the national reference scenario, it appears that the analysis of current historical trends is not enough. Therefore, Madagascar will progress towards a projected reference scenario to take future threats into account.
- For the establishment of the MRV system, Madagascar will improve its standards for cover monitoring and its knowledge on carbon storage capacities of various types of vegetation and soil. Studies will be carried out during the first two years and national capacities and expertise will be improved. The system will be finalized during the third year.

Along with this process, the country will perform early actions for lessons learned and to inform national-level discussions.

On management and cost of the readiness process

This REDD+ readiness process has multiple dimensions and involves multiple sectors and multiple levels. Hence, the program management arrangement will take place at three levels:

- A decision-making level, the Inter-ministerial Committee for the Environment, headed by the Minister in charge of the Environment. It will gather decision-makers from the key ministries affected by the decrease of forest cover. Its mission is to integrate policy and arbitration aspects at inter-sectoral level.
- A technical coordination level, by a coordination platform with members of the Administration, the civil society, the private sector, and NGOs. Its role is to discuss and then technically validate recommendations and proposals from activities related to the process. Its members acting at the regional and local level will be called upon to facilitate consultations with stakeholders.
- An activity implementation level by an Executive Office and a contracted Trust Agent.

Implementation of the R-PP in Madagascar requires US$ 5.554 million.

Component	Estimated Cost (US $)	Percent of total
1a National Readiness Management Arrangements	779 210	14,0%
1b Stakeholder Consultation and Participation	628 890	11,3%
2a Assessment of Land Use, Forest Policy and Governance	192 420	3,5%
2b REDD+ Strategy Options	387 080	7,0%
2c Implementation Framework	130 390	2,3%
2d Social and Environmental Impacts	210 470	3,8%
3 Reference Scenario	1 614 870	29,1%
4 MRV: Monitoring, Reporting, and Verification	1 445 890	26,0%
6 Monitoring and Evaluation of Readiness Implementation	164 500	3,0%
TOTAL COST of the R-PP	5 553 720	100,0%

COMPONENT 1: ORGANIZE AND CONSULT

1a. National REDD+ Readiness Management Arrangements

A. Overview and requirements for the arrangements

The global objective of the REDD+ readiness management arrangement is to manage and coordinate medium to long term REDD+ related activities and to ensure their integration in the various carbon-efficient national strategies and the national development plans.

To achieve this goal, the REDD+ readiness process should be supervised through an efficient and consistent management arrangement. The elements of this structure should (i) have multidimensional intervention capacities, (ii) have a proven experience on REDD+, (iii) be responsive (iv) ensure direct influence on the relevant decision-makers involved in policies and strategies, and (v) be able to play a pivotal role to ensure uninterrupted actions throughout the process, from the preparation phase to implementation and monitoring.

The REDD+ readiness management arrangement is divided in several levels to meet these capacity needs. A dynamic and effective system requires integrating current experience and valorizing available capacities of institutions, resource persons, and those who contributed to the REDD+ process in Madagascar. Therefore, it has been decided:

(i) To optimize the capacities of the resource persons who initiated the process, i.e. CT-REDD[1];

(ii) To use the existing facilities as much as possible, in order to speed the process.

B. National REDD+ Readiness Management Arrangements

To reach its goals, the main roles of the national REDD+ readiness management arrangement, to be officially mandated through an inter-ministerial order, are: (i) to ensure integration of REDD+ strategies in sectoral policies and strategies, (ii) to implement REDD+ strategies in general, and (iii) to manage the process and coordinate REDD+ related actions in Madagascar.

To perform its multi-dimensional tasks, the readiness management arrangement will be divided in three distinct levels: (i) a decision-making role played by CIME; (ii) a steering, coordination, and technical support role played by CT-REDD (during the three years of readiness process, the latter will gradually become the REDD+ Readiness Coordination Platform, PCP-REDD+); and (iii) an operational role played by a REDD+ Executive Office (BER) managed by an Executive Secretary who will ensure that activities are implemented according to the defined plan and develop the REDD+ readiness technical reports.

To implement the REDD+ process, the Directorate-General on Forests made all arrangements to maximize consistency with the Forestry Policy and to improve the relationship between the Government and the REDD+ Readiness Coordination Platform through the creation of U-REDD. This unit is the direct interlocutor of both the PCP-REDD+ and the technical and financial partners on REDD+. Located within the Forest Administration, it plays an important role during the preparation phase as REDD+ develops strategies against deforestation and forest degradation and aims at the sustainable use of forest resources, as a tool to address climate change.

[1] CT-REDD: REDD Technical Committee gathering technicians with multi-dimensional capacities and with a good command of the REDD+ process. Several members represent partners and actors working on REDD+.

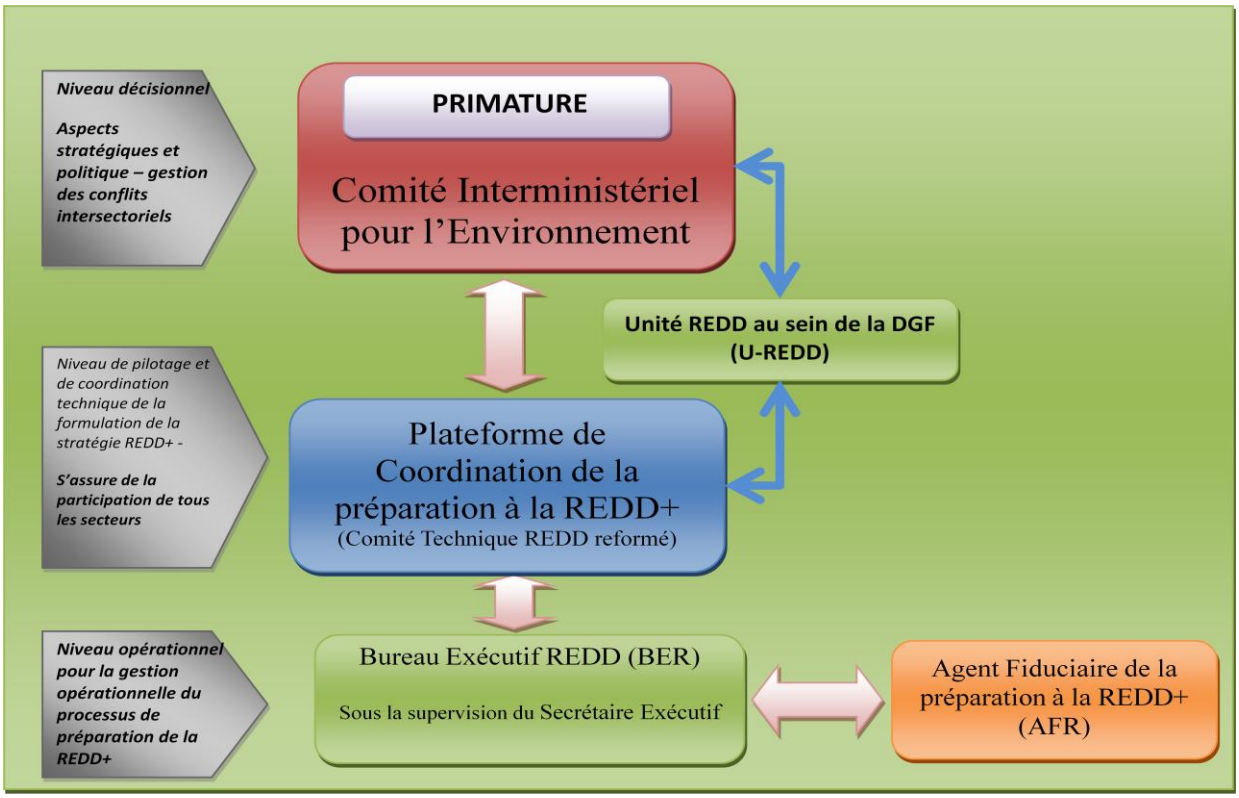


Figure 1 : Dispositif de gestion de la préparation à la REDD+

C. Roles and responsibilities of existing facilities for REDD+ readiness

Since 1990, the year the Environmental Charter was adopted, several facilities at national and decentralized levels have steered strategic processes. Several historical facilities can potentially be used for the development of REDD+:

Table 1. Summary of existing facilities in the environmental sector in Madagascar[2]

Institutions	Current mission	Future mission under REDD+
Inter-ministerial Committee on the Environment (CIME)	All sectors, very high level – under the Prime Minister's Office Ensures the integration of environmental requirements in sectoral development plans	(i) Define and coordinate the strategy aspects to integrate into sectoral policies, to achieve REDD+ objectives in Madagascar; (ii) Mediate in case of conflicts between some development objectives and forest conservation strategies. Mediation will be based on a detailed report by the PCP-REDD+, assessing the various potential scenarios, (iii) Give political advice on some key aspects of REDD+: regulations, financial sustainability, State commitment and funding, institutional arrangement, and implementation framework. Operational and capacity-building schemes are planned. An operating budget of this structure will be set up the BER and certified by the PCP-REDD+
Ministry in charge of the Environment and Forests	Ensures the protection of the unique environment and natural resources to benefit the Malagasy people and the country's sustainable development	
Forestry Commission	Determines various actions on forest	Relay the REDD+ Readiness Coordination Platform

[2] Details on existing facilities are presented in Annex 1a-1

	resources management, at the level of each region. The Forest Commission is open to the participation of other sectors or persons as it deems useful for deliberations. It is either an advisory or a decision-making body on forest resources management, based on the subject	at regional level.
REDD Technical Committee (CT-REDD)	Steers the development process of the R-PIN and the R-PP. Coordinates all REDD+-related activities. Responsible of the REDD+ process in the country	Transform into a REDD+ Readiness Coordination Platform, at national level.
REDD+ Readiness Coordination Platform		The PCP-REDD+ ensures that the REDD+ readiness process informs all ongoing discussions under important initiatives in the environmental and forests sector (policy, strategy document, sectoral programs, etc.). PCP-REDD+ is the steering and technical coordination body for the development of the REDD+ strategy and technical components. It ensures resolution of inter-sectoral conflicts, and if needed brings them to the attention of the CIME. It (a) validates and assesses technical works; (b) ensures participation of all relevant sectors; (c) prepares implementation of REDD+ intervention directions; (d) manages the development process of required reforms to implement REDD+.

D. Roles and responsibilities of planned new facilities

From the beginning of the implementation of the R-PP, a handbook defining the roles and responsibilities of all facilities will be developed by the BER, validated by the PCP-REDD+, and disseminated to all actors.

D.1. The REDD+ Unit within DGF

The REDD+ Unit (U-REDD) is a formal facility established by ministerial order from the Ministry in charge of forests. This facility is the official interlocutor in the Ministry in charge of forests with national and international entities for the global aspects of REDD+. Therefore, U-REDD represents the Ministry both on technical and financial aspects with other organisms working on REDD+, at national and international levels. In addition, U-REDD works on linking the REDD+ process to the decision-making process (political and strategic) of all relevant technical sectors. This unit is also in charge of the national REDD registry.

In its sovereign role, the U-REDD ensures that the activities of REDD+ projects comply with the forest policies on sustainable use of forest resources, from the preparation phase to implementation and monitoring. Therefore, the U-REDD plays a pivotal role in the management arrangement and ensures the continuity of actions throughout the various phases of the REDD+ process.

The creation of this facility further highlights the strong involvement of the State through the Forest Administration in the REDD+ process in Madagascar. It is crucial to maintain the stability of this facility for the strategy actions to progress and continue at all levels of REDD+ in Madagascar.

It consists of 3 technicians and an accountant secretary:

- The team leader is in charge relational functions and the daily running of the unit. He or she participates in the activities of the PCP-REDD+
- The two other technicians hold the national REDD+ registry and provide technical supports.

U-REDD is in charge of the secretary department of CIME concerning its REDD+ works.

D.2.The REDD+ Readiness Coordination Platform

For the Technical Committee to become the REDD+ Readiness Coordination Platform (PCP-REDD+), sectoral representatives in this structure should be able to make technical decisions relevant to their respective sectors. Technicians currently participating in the committee can continue to play their technical roles, while assisting their supervisors who are automatically members of the Platform. Therefore, designation of PCP-REDD+ members should take into account purely technical capacities of resources people, to ensure that respective involvement and contributions are not subject to institutional changes.

PCP-REDD+ ensures that the REDD+ preparation process is integrated in all ongoing discussions under the important initiatives of the forest and environment sectors (development of policies, strategy documents, sectoral programs, etc.).

PCP-REDD+ is the steering and technical coordination body for the development of the REDD+ strategy and its technical components. It ensures resolution of inter-sectoral conflicts and if needed, brings them to the attention of the CIME. Its functions are to (a) validate and assess all technical works; (b) ensure participation of all relevant sectors, (c) prepare the implementation of the REDD+ intervention directions, and (d) manage the development process of needed reforms to implement REDD+.

Opening the platform to other sectors and stakeholders is guaranteed, so that the structure could provide the essential elements to fulfill its mission. Representation of the civil society and the private sector will be improved, by integrating other associations and/or environmental organizations, particularly those directly working with local communities living near forest resources.

The same applies to improve integration of regional players. The Regional Forest Commission will relay the Platform at the regional level, from the preparation phase to the implementation of REDD+.

PCP-REDD+ will be created by inter-ministerial executive order. The mechanism will ensure implementation of the REDD+ strategy in Madagascar, but its mandate will evolve over time.

The members of the PCP-REDD +, summing up 28, are allocated as follow:

- 6 representatives of the public administration (Forests and environment, Agriculture, Livestock, Energy, MATD)
- 3 representatives of the malagasy civil society
- 2 representatives of the community-based federation
- 3 representatives of the private sector
- 5 representatives of the technical and financial donors
- 5 representatives of the national environmental associations
- 2 representatives of regions
- 2 Universities and research institutions

D.3. The REDD+ Readiness Executive Office (BER)

The BER is the technical and operational body for the process. It ensures that all activities and studies follow established standards. It is also in charge of expense commitment. Its main tasks include: (i) managing the process, planning and implementing all operational activities, (ii) participating in the development of REDD+ strategies and ensuring the effectiveness of subsequent implementation, (iii)

ensuring good communication with the various stakeholders, and (iv) ensuring effective collaboration with the PCP-REDD+, a potential source of needed technical support on REDD+; it can call upon national and international experts.

BER is created by ministerial order. Its organization will be revised based on implementation requirements. It is managed by an Executive Secretary recruited through a call for tenders, technicians in charge of the various components of the R-PP, and administrative and financial staff. An annual activity report (technical and financial) including an assessment of prospects is prepared by the BER and communicated to U-REDD, PCP-REDD+, and CIME.

The ToR of the BER staff and the outline of the annual report are provided in the annexes 1a-1 and the relationship between U-REDD, PCP-REDD+ and the BER in annex 1a-2.

D.4. The REDD+ Readiness Trust Agency

The role of the REDD+ Readiness Trust Agency can be played by one of the existing financial institutions, independent and working in the environmental sector, based on the required use of funds. It provides to the BER, the ordering party, the required funds to implement the activities planned and validated by the PCP-REDD+. It manages funding and budget limits according to donor regulations and ensures production of financial reports. It will ensure compliance with procurement, financial management, and treasury procedures.

Table 2: Summary of national readiness management arrangements activities and budget

Main Activities	Sub-Activities	Estimated Costs (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Management tools and staff	Recruitment	0.70			0.70
	Development of BER management tools	30.18			30.18
	Initial training	9.02			9.02
	First installation: Material and office establishment	23.00			23.00
	Acquisition of vehicles, computers, photocopiers, and communication material	48.56			48.56
Operations	Office operations: salaries and social expenses	73.83	73.83	73.83	221.49
	Office operations: expenses and services	22.80	22.80	22.80	68.40
	Vehicle operations (except missions outside of Tana)	9.20	9.20	9.20	27.60
Activities and recurrent costs	Management of BER operations	9.25	12.10	3.85	25.20
	Development of the final management arrangement		5.23	16.52	21.75
	Communication and relations with sectoral actors	17.44	17.44	7.92	42.80
	Management costs PCP-REDD+ and CIME	73.39	74.80	41.52	189.71
Management costs of program	Financial and accounting management fees	18.00	18.00	18.00	54.00
	Annual audits				
	Incidentals	5.60	5.60	5.60	16.80
	TOTAL 1A	340,97	239.00	199.24	779.21

1b. Stakeholder Consultation and Participation

A. Justification and context

The readiness process should be inclusive and transparent. The fact that an agency or organization takes the lead and organizes the process should not prevent consultation or participation of other stakeholders. This applies both to the initial development phase of the R-PP and to the last analytical phase.

For the development phase, the country submitting the R-PP should highlight thorough initial consultations of relevant stakeholders. The last implementation phase includes a Consultation and Participation Plan. This plan anticipates the time when the R-PP will be financed; it aims at improving integration, transparency, and responsibility of the decision-making process during the entire preparation phase. During the implementation phase of the R-PP and the development of the various readiness components, the country uses this consultation and participation plan through the planned consultation procedure. Therefore, the consultation and participation plan is a core element of the national mechanism for REDD readiness.

Public participation in environmental management is defined both in the Malagasy Constitution and the Environmental Charter of Madagascar[3]. The REDD+ process keeps the same principle of participation based on the model of the Forest- Environment sector.

For this sector, development of policies, programs[4], and management tools[5] are based on consultation and participation of stakeholders. Consultations include (i) an overview of the subject; (ii) questions and answers; (iii) integration of views, observations, and concerns; (iv) consensus on conflicting points; (v) resolution; (vi) synthesis; and (vii) dissemination of consultation results to the relevant entity for validation and decision-making. The consultation and participation processes are performed through meetings, seminars or local, regional, and national workshops, direct discussions with communities in the field, and radio and or TV- broadcasted discussions. The process is supported by various tools and methods including maps, field visits, and MARP.

The Administration formalized this process through:

- The development of guidelines and regulations on consultations with stakeholders on certain projects (public consultation in MECIE[6]; awareness-raising during management transfer; public consultation for the establishment of a new protected area[7]-[8] , etc.); and
- The implementation of mechanisms to facilitate consultations: Forest Commissions, Planning and Monitoring and Evaluation Platforms, Multi-Local Planning Committees, etc. Such formal mechanisms take the form of either a participation and dialogue platform or a co-decision-making and co-management platform. In some cases, structures also serve as mechanisms to solve conflicts and disputes among stakeholders, such as the Inter-ministerial Committee Mining-Forests (CIMF) or the "dina"[9] at the local community level, created for sound management of forest resources and resolution of potential conflicts.

The various consultation and participation processes in Madagascar contributed to the standardization of sectoral policies and strategies, the resolution of conflicts (e.g. mining and forests), the production of tools and strategies for sound resources management (e.g. forest zoning, local tenure

[3] *Environmental Charter, law n° 90 033 of December 21, 1990 and its amendments*
[4] *National and regional forest master plan*
[5] *Zoning, Management plans*
[6] *Decree n° 99-954 of December 15, 1999 modified by Decree n° 2004-167 of February 03, 2004 on the environmental compliance of investments*
[7] *SAPM Handbook on the establishment of terrestrial protected areas*
[8] *Community consultation guidance*
[9] *A "dina" is a type of social contract or pact set by common agreement within a community. It dictates rules and behaviors towards an object (here, forest resources) and defines sanctions in case of violation or infringement of the agreement. Dina is a true institution in the Malagasy rural world.*

plans, tenure office, SRAT, SAPM, KoloAla), and the participation and empowerment of local communities in forest resources management (management transfer, community protected area, etc.)

Consultation of stakeholders for the development of the R-PP is led by CT REDD. Jointly headed by the Ministry in charge of the Environment and Forests and the Environmental National Office (ONE), it was originally established by the implementers of REDD pilot projects in the country (See Annex 1b-1). It included a dozen members working on producing the Madagascar R-PIN in 2008. The Committee added other members for the development of the R-PP, including representatives of the ministries in charge of agriculture, livestock, land planning, transport, the National Tenure Program, the association managing protected areas[10], the Foundation for Protected Areas and Biodiversity of Madagascar, the National Environmental and Forest Observatory, and UNDP. Many of these institutions joined CT REDD after the first series of R-PP consultations, convinced that their contribution is important for the development of the strategy document.

During the implementation phase of the R-PP, CT REDD will become PCP-REDD+ and will steer the consultation plan. This multi-sectoral platform present in the field will reach the local actors and will change the consultation process into an actual negotiation between stakeholders.

Box 1: Principles of public consultation and participation

It is strongly recommended to initiate a communication process for stakeholders to include their interests, values, and concerns, so that their opinions actually have an impact on the development of a national strategy. A communicative approach should be adopted at the beginning of the process to maximize social acceptance. Therefore, applied criteria should follow the best practices for participation:

- Stakeholders can express their opinions on decisions that might affect them,
- Their contributions actually influence decisions,
- Their interests are clearly understood,
- Potentially affected parties are clearly identified and involved in the process,
- Stakeholders contribute in defining the way they participate in the process,
- Required information to participate in the process is provided to stakeholders, and
- Stakeholders are reassured that their contribution is useful for the decision-making process.

B. Consultations held during the development of the R-PP

Consultation and participation for the development of the R-PP was a two-staged process: at central level (national, political) and at decentralized level (local, commune, and region). The objective was to ensure that relevant parties affected by deforestation and forest degradation, through a representative sample:

- Are informed about the R-PP development process;
- Voice their opinions on the assessment and discussions on a potential REDD+ strategy, including on forest governance, a particularly sensitive subject given the current illegal logging of rosewood;
- Recommend solutions and actions they deem relevant, on improving governance and enhancing involvement of local communities in the discussions and decisions; and
- Start the ownership and empowerment process for actions to reduce greenhouse gases emissions from deforestation and forest degradation;

Consultations at central level

The first consultations were carried out among the ministries in charge of the environment and forests, agriculture and livestock, land planning, transport and their subsidiary bodies led by their director/director-general, national and international NGOs, and the Koloharena Confederation. Managers of services, departments, or projects, with direct or indirect links with deforestation and forest degradation issues, and managers of environmental units participated in the process. Consultations

[10] *Madagascar National Parks, formerly ANGAP*

started with an overview on (i) REDD+, the readiness process, the causes of deforestation and degradation, and potential strategy options and (ii) past or present baselines and actions of the consulted party against deforestation and forest degradation. The causes of deforestation and degradation and the strategy options related to the relevant sector were articulated in a way acceptable by all. The issues addressed during this series of consultations are summarized in Annex1b-1.

A series of specific consultations identified (i) existing data on forest cover assessments and deforestation analysis (stakeholders, results, methods, limits), (ii) studies done in REDD pilot projects: methods, results, problems encountered, (iii) missing data for the development of the reference scenario and the creation of the MRV system, (iv) ongoing and/or planned efforts and research, and (v) existing national capacities to be potentially involved in the preparation and implementation of REDD+.

With the 5 pilot projects on REDD, the Forest Administration and ONE capitalized on their experience on governance, including on carbon ownership rights, methodology options for baseline definition, and elements for the MRV at the local community level. To achieve their goal on reducing deforestation, most projects relied on the transfer of forest resources management to local communities.

Several actors at national and strategic level were consulted and provided the following recommendations:

- The tenure platform SIF (Sehatra Iombonan'ny Fananan-tany), gathering about thirty farmer organizations focused on tenure issues, highlighted the need for a balanced representation in the REDD+ decision-making bodies and processes between entities involved in the sustainable management of natural resources and those working on rural development[11];
- The national-level platform of the environmental civil society Alliance Voahary Gasy, gathering about thirty organizations focused on sound governance of natural resources, highlighted the balance and respect of rights and responsibilities among the private sector, the State, and civil society organizations. As sustainable entities, the latter can ensure that the strategy implementation is not interrupted in a politically unstable country. Under the subsidiarity principle, it recommends local empowerment (collectivities, local communities and civil society) and resolution of all types of timber traffic;
- The gender observatory SI MIRALENTA integrated the gender concept in Components 1, 2, and 4 of the R-PP ;
- The National Tenure Program[12] recommended pursuing and enhancing decentralization of tenure management for better management of access to forest soils, an important aspect related to land clearing;
- The dialogue circle of technical and financial partners in the environmental sector[13], a monitoring and dialogue unit of about fifteen partners and international donors formed since the beginning of the political crisis in Madagascar in 2009, provided assurance on its support for the next submission of the R-PP;
- The main mining and oil private operators expressed their interests to address deforestation and forest resources degradation and their commitment to comply with their requirements on environmental impacts;

The scientific and academic community deemed relevant to build a network to support their contributions to the production of needed data, the development of

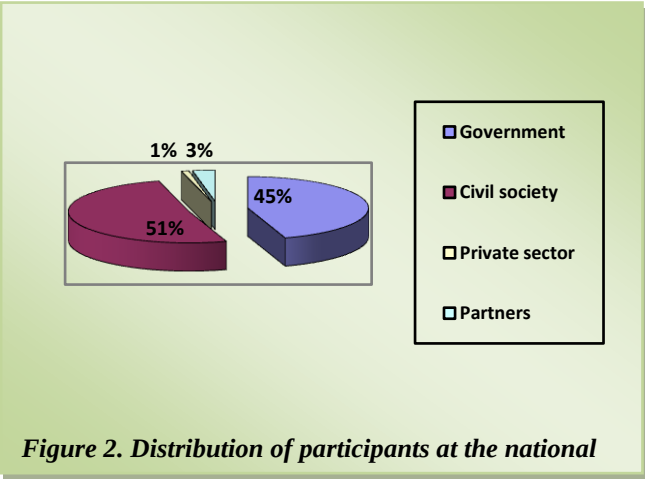


Figure 2. Distribution of participants at the national

[11] Actors in the rural development field include those in the agriculture (including hydro-agricultural management), livestock, water and sanitation, education, and health sectors.
[12] The National Program on Tenure Reform was in charge of tenure reform before the 2009 political crisis.
13 Informal coordination structure

methodologies for implementation, and capacity-building. They also suggested considering the commune as a reference entity for consultations and strategy implementation.

Other comments, observations, and suggestions were gathered through:

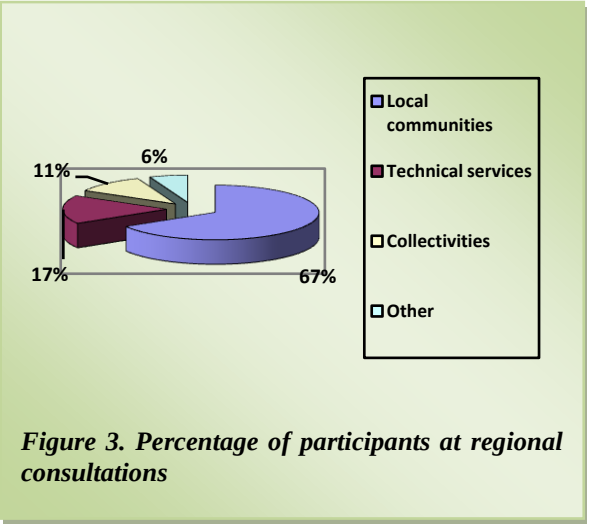


Figure 3. Percentage of participants at regional consultations

- A national validation workshop gathering about a hundred people (distribution in Figure 2). Resolutions are summarized in Annex 1b-2,
- Dissemination of the final draft in French and in English on the websites of some CT REDD members, and
- Submission of version 10 to a review committee including a dozen people, selected based on the diversity of their experience and capacities to bring different views on the document, while maintaining some thematic and strategic consistency. Their remarks are summarized in Annex 1b-3.

Consultations at decentralized level

For the 7 regional consultations, CT REDD developed a methodology guidance based on a participatory approach with tools adapted to the capacities of consultation targets and following the FCPF "Technical guidance on public consultation and participation under REDD". The developed guidance includes tools in the local language. Videos, maps, drawings, and figures contributed to a visual and schematic approach of the subjects. Agents working in local projects were in charge of coordinating the process, ensuring exchanges in both the official language and the local dialect to facilitate the dialogue.

Consultations were based on representativeness:

- Consulted regions[14] are those with (i) a heavy trend of deforestation from various causes (land-use changes, illegal logging, governance issues, etc.), (ii) a significant forest area, and (iii) a combination of REDD+ project areas and non-REDD areas.
- Participants came from various areas in each region: the 7 maps on the distribution of the 350 participants in Annex 1b-4 show the representation in terms of ecosystems, zoning, tenure regime, natural resources management regime, pressures, etc.
- Local representatives were majority (fig. 3) and include various entities such as the local communities managing natural resources, farmer organizations, water users associations, parents associations, traditional chiefs, and religious leaders.

Table 3. Spatial representation of the regional consultations carried out in 2010

	Number	%
Regions *(The Analanjirofo consultation included 2 regions)*	8 out of 22	36 %
Communes	421 out of 1546	27 %
Forest area	5.54 million ha out of 9.5 million ha	58 %
Ecosystem	5 out of 6	83 %
Regions affected by illegal logging of rosewood since 2009	2 out of 2	100 %
REDD pilot projects	5 out of 5	100 %

[14] *Amoron'i Mania (Central-South), Boeny (North-West), Analanjirofo (East), Atsimo andrefana (South-West), Menabe (West), Alaotra Mangoro (Central-East) and SAVA (North-East) regions.*

The low level of participation of women during regional consultations (20% of the total participants) is due to the distance between their home and the regional administrative centers where the consultations were held. The distance is compounded by the rugged terrain of forest areas, and travel time was often longer than the duration of the workshop. This will be improved in the future by holding consultations at the district level.

Outcomes of regional consultations

The main conclusions of regional consultations are the following:

- ✓ The COBA suggested improving integration of their roles in sustainable forest management. They should be included both in awareness and support to forest surveillance and in governance monitoring at local level. Local entities should be consulted in priority on all decisions on local forest management (any type of logging, secondary products, and allocation of mining permits). The legitimacy of local communities will be enhanced through empowerment systems such as management transfers, co-management of protected areas, or allocation of part of the revenues from ecosystem services.
- ✓ Consulted stakeholders expressed an urgent need for capacity-building and improving communication among parties involved in sustainable forest resources management. The priority should be the creation of an information and education system at all levels on the issues, medium- and long-term challenges, and prevention of poor forest governance. Participants recommended a strict enforcement of rules and regulations and related procedures to restore sound forest governance, an important factor for an effective REDD+.
- ✓ Participants systematically insisted on the dependence on forests: socio-economic alternatives were suggested to improve community livelihoods while promoting conservation. To compensate for the reduction of access to forest resources under REDD+, it was recommended to create a compensation plan with income-generating small projects. Capitalization of outputs of similar plans at national level will improve this approach: ensure initial financial support, enhance the financial and technical capacities of stakeholders, support the process towards a market economy, or collaborate with support and interface entities such as CSAs[15]. Collaboration with micro-finance institutions and NGOs should be enhanced.
- ✓ Cases of illegal logging of precious woods have indicated that few people have a full understanding or knowledge of the wealth of legal documentation. Legal interpretations also vary greatly. The COBA witnessed several reported offences with a subsequent discharge of the offender when the case arrived at court level, due to the lack of enforcement of legal procedures. Another issue is the limited number of forest agents and the lack of coordination of enforcement entities for forest surveillance. Participants concluded that the control of illegal logging requires a large-scale enforcement of the tendering of logging permits. They also insisted on monitoring and enforcing regulations on management transfer, protected areas management, and mining in forests, in collaboration with local communities.

C. Consultation plan for REDD+

Consultations for REDD+ readiness will be led by the PCP-REDD+ and carried out by the Executive Office. They will continue and widen the consultations of stakeholders to involve them, gain their acceptance, and empower them for REDD+ strategies and activities.

Consultations will include the following key elements: management arrangement, causes of deforestation and degradation, strategy options, institutional framework and strategy measures for REDD implementation, the Strategic Environmental and Social Assessment (SESA) process and safeguards, the reference scenario, the MRV, and monitoring and evaluation.

[15] CSA: agricultural services center, a sustainable interface structure between provision and demand of agricultural services, present in all districts of Madagascar

Consultations of stakeholders will fit in the SESA development through an information and capacity-building stage (simultaneously with the outline phase for SESA), a consultation phase *per se* (external evaluation phase for SESA) and a dissemination phase of the REDD strategy integrating the SESA (figure 4)[16].

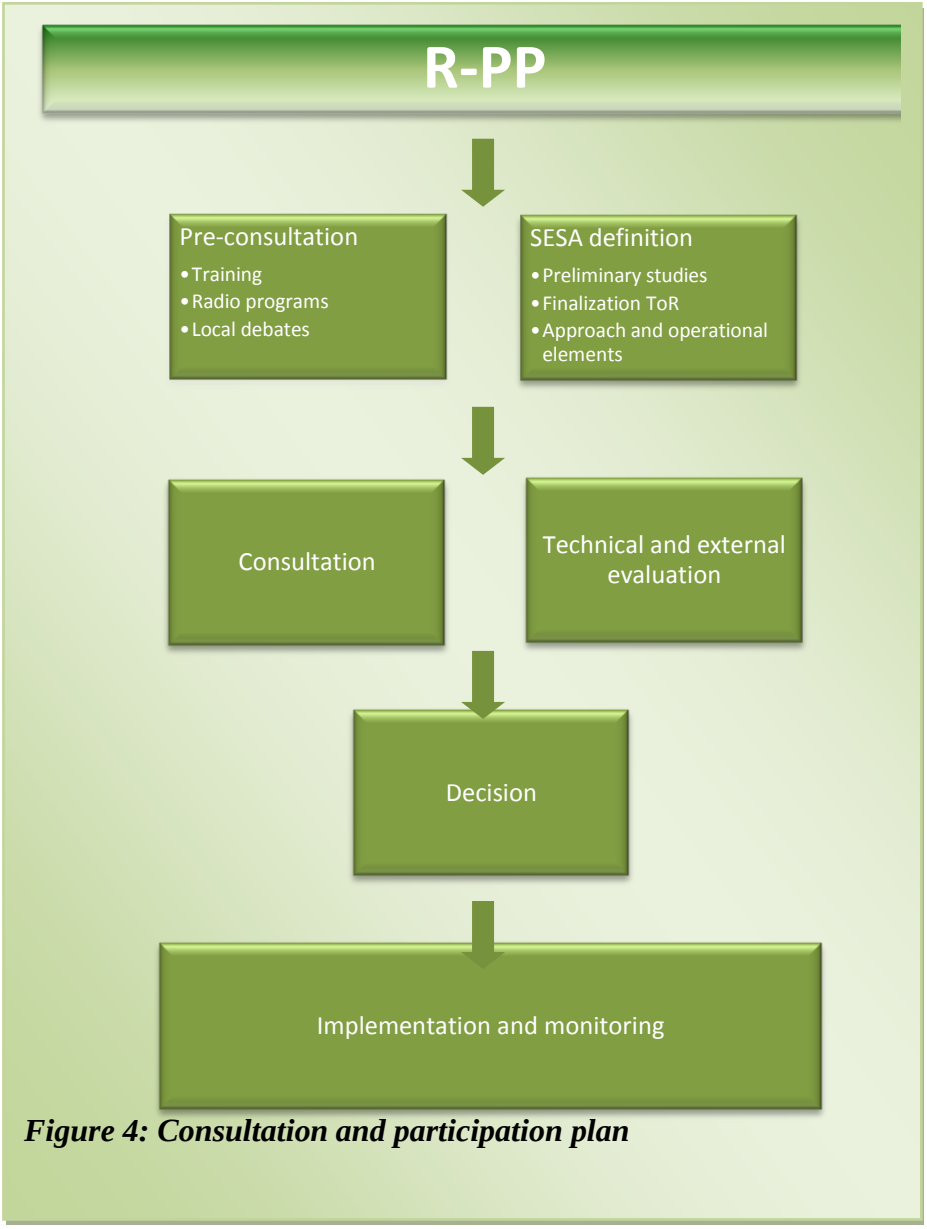


Figure 4: Consultation and participation plan

In addition to the selection of consultation areas for the development of the R-PP, two other criteria apply to potential deforestation and forest degradation areas and high biodiversity areas. All criteria help define 12 administrative regions for readiness strategy consultations, half of their districts, and fifth of their communes (Table 4)

Consultations on the causes of deforestation and degradation, the strategy options, the reference scenario, and the MRV will take place at district, inter-regional (grouping of 2 to 4 regions), and local levels, in partnership with PCP-REDD+ members.

[16] Completed by *Figure 10. Public consultation levels* (Component 2d)

Table 4. Crossing of criteria for the selection of regions for consultation

Nature of areas for consultation	*Local (community & commune)*	*District*	*Region and inter-regions*
Leakage areas **REDD+ potential areas** **High biodiversity areas** **Importance of the affected population** **High deforestation potential areas**	25% of communes	50% of districts	- Wet dense forest: SAVA, Analanjirofo, Alaotra Mangoro, Vatovavy Fitovinany - Dry dense forest, spiny forest and mangrove: Menabe, Atsimo andrefana, Boeny, Melaky, Androy - Tapia, : Amoron'Imania - Artificial pine and eucalyptus reforestation: Analamanga, Haute Matsiatra

Targets

Based on past experiences, 4 types of audience will be consulted: the **general public** to be informed on REDD+ trends, the **interested public** (stakeholders) to provide expected feedback to align interests, the **concerned public** to be committed and the **affected public** (shareholders) for the final negotiation for consensus and partnership. The word "public" is used in its generic sense and can include opinion leaders, private operators, institutions, decision-makers, and communities. A representative percentage of women and vulnerable sectors should be defined in advance.

Table 5. Diversity of actors to include in consultations

Regions	Types of actors
Sava, Alaotra Mangoro, Analanjirofo	Communities managing natural resources, slash-and-burn farmers, cash-crop farmers (coconut, vanilla, sugarcane, cloves), stakeholders in the timber market, etc.
Menabe, Atsimo Andrefana, Androy	Communities managing natural resources, corn farmers, cash crop farmers (beans, lima beans), stakeholders in the timber market, mining and oil operators, etc.
Amoron'i Mania	Communities managing natural resources, farmers (slash-and-burn, sugarcane, tobacco), craft carvers, stakeholders in the timber market, etc.
Vatovavy Fitovinany	Communities managing natural resources, small-scale mining operators, stakeholders in the timber market, etc.
Boeny, Menabe	Communities managing natural resources, stakeholders in the timber market, users of mangroves (crab harvesters, small-scale fishermen, etc.), shrimp industry, sea salt extraction, livestock, etc.

At local level, populations affected by the REDD strategy, including those whose activities are a source of land-use conflicts, should be included in all consultations (Table 5).

Members of the PCP-REDD+ will be approached to disseminate information, help select representatives for the consultations at district, inter-regional, or regional level, and facilitate reporting on important decisions. This outreach action will improve the participation of COBA representatives in the negotiations by facilitating a real discussion at local level.

Consultation steps

1) Information, awareness, and communication

Information is disseminated to increase public awareness and concerns on the subject. Information on the R-PP, the readiness process, available means and their use will be shared. The reference situation, strategy options, and implementation arrangement proposed in the R-PP will be presented to enhance knowledge, acceptance and participation. The communication campaign will use various media and events at national, regional, and local levels: newspapers, radio, TV, fairs, conferences, exhibits, etc.

Information material in the local language and accessible to the general public will be developed and disseminated. Journalists and information specialists will be trained and called upon.

In addition to PCP-REDD+ members, dialogue structures such as the regional Forest Commissions, the Regional Planning and Monitoring and Evaluation Platforms, periodic meetings of communal teams, projects, NGOs and associations working in the field will be approached for these actions. Consultations for the same targets will be grouped to optimize the use of resources and prevent overwhelming of the relevant parties.

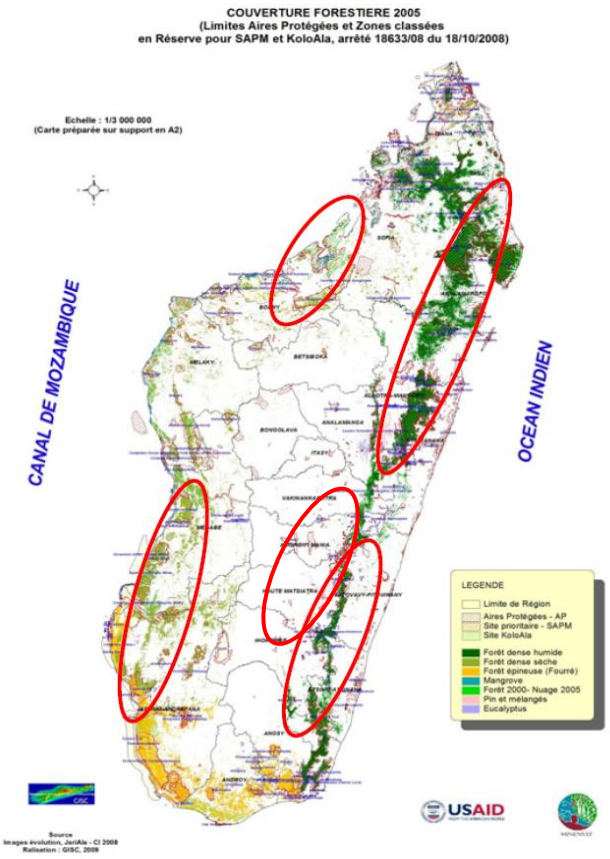


Figure 5. Consultation areas for the development of the REDD+ strategy, based on biomes and administrative regions

The SESA will focus on local communities, including traditional authorities, communities living or not near forests, informal or non informal loggers who might be affected by the strategies defined in the R-PP. The objective is to determine the REDD+ related environmental and social concerns and challenges and mitigation measures. This type of consultation is consistent with the existing provisions and procedures on the development and assessment of SESA. It will take place under the preliminary study and outline of SESA[17]. These consultations will ultimately collect detailed opinions and assessments on the impacts of the implementation framework of strategies, intervention directions, and safeguards. At the respective end of these consultations, the refined detailed ToRs for SESA, the detailed consultation plan for the SESA phase, as well as the SESA implementation plan will be produced. The preliminary detailed SESA will be evaluated by ONE with the Technical Assessment Committee (CTE) including representatives of the relevant sectoral ministries, to gather their technical opinions and to integrate sectoral and social aspects in their respective sector.

2) Consultation

Based on the indications of the MECIE decree on environmental studies, in addition to the technical assessment by a committee including representatives of all relevant sectors, public participation should be conducted through local consultation. This consultation can be done using public surveys, public audience, or both. ONE is responsible for the definition and arrangements for public participation in evaluating an EIA or a SESA, as well as for assessing the organization of various consultations at local, regional, or national levels.

The consultation *per se* is done in 4 stages: feedback, consultation, dialogue, and negotiation. The relevant public for these 4 stages differs in terms of interest and level of involvement: the BER – in partnership with the PCP-REDD+ – should make sure that all types of public have access to the relevant information and feedback tools in an adequate timeframe.

(i) Feedback: following each awareness and capacity-building campaign, part of the general public provides its feedback on the project. The BER should provide tools and mechanisms to gather

[17] Details under Component 2d

such feedback. It will handle the feedback by classifying reactions and assessing issues for accurate response and planning. Refinement studies, polls, or surveys could help refine some recommendations. Cross-checking will also be performed among relevant sectoral institutions, to collect needed information for the selection of strategy options (economic costs and benefits, technical and institutional feasibility, risks of leakage, etc.).

(ii) Consultation: this step will focus on the facilitation of feedback from people who might be affected by the project. This involves their participation in the exchanges and discussions and facilitation of proposals to actually influence decisions and consensus-building. Activities will take place at regional and inter-regional levels, with the participation of sectoral managers and regional and communal authorities, for all technical sessions, discussion and recommendation workshops, and support sessions for reporting on technical and financial studies.

(iii) The dialogue aims at committing important actors. The objective is to support decision-making on REDD+ at the level of sectoral decision-makers, on policies, institutional and regulatory frameworks, and main strategy directions related to REDD+ needs. Examples include regulation adjustment for the forest sector, validation of institutional options for carbon management, or validation of policy measures. This type of consultation will take place after the dissemination to sectoral decision-makers of the results of other types of consultations and studies for validation, or during the alignment of policy, institutional, and regulatory mechanisms with REDD+. Therefore, this type of consultation will take place throughout the finalization of the REDD+ strategy.

(iv) Negotiation to develop acceptable or even satisfactory solutions for all actors. At this stage, decisions and conditions for application will be jointly developed.

3) Dissemination of the REDD+ strategy

This stage focuses on the beginning of the readiness phase of Madagascar. The key elements of the REDD strategy will be presented: the reference scenario, the strategy implementation mechanism, the monitoring system, and the bio-physical and socioeconomic monitoring indicators.

Table 6. Summary of stakeholder consultation and participation activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Information and awareness of the general public on REDD+, the R-PP, the development process of the strategy, the key elements of the strategy and dissemination of the strategy	Initial information sharing (REDD+, R-PP, readiness arrangement, etc.)	115.00			115.00
	Regular communication on development: provide feedback on the key ideas for the baseline, strategy options, implementation mechanism, and carbon governance	39.55	39.55	39.56	118.66
	Collection & analysis of opinions on disseminated information		4.50		4.50
	Dissemination of strategy	76.66			76.66
Consultation to collect elements for each intervention direction for prioritization	Collection of socioeconomic, political, and cultural information on each intervention direction and reference information at regional level	48.22			48.22
	Collection of additional information among various institutions to complete and cross-check information and base data		14.38		14.38
Consultation to assess leakage risks to inform the combination of intervention directions	Collection of socioeconomic, political, and data and information underlying the displacement of emissions from deforestation in degradation in and around potential REDD+ sites		41.50		41.50
Dialogue on the pre-finalized strategy	Collection of views and observations of sectoral decision-makers on the pre-finalized strategy in terms of policies, regulations reforms, institutional arrangement, planned programs, resources, etc.			46.15	46.15
Consultation on carbon revenue governance	Capitalization on experiences on forest revenue management to draft a global outline for governance and revenue-sharing			3.70	3.70
	Dialogue and negotiation on management and transparent management of revenues (including accountability)			51.45	51.45
Implementation of the detailed SESA	Collection of opinions and concerns on strategies and their environmental and social impacts				pm
	Validation of the preliminary detailed SESA				pm
	Evaluation of the detailed SESA				pm
On the reference scenario	Identification of best explanatory variables of deforestation and degradation	54.56			54.56
	Model validation		1.00		1.00
	Presentation and validation of a first version of the model			21.44	21.44
	Presentation of the final version of the model			10.07	10.07
	Consultation on the monitoring system	7.20	7.20	7.20	21.60
	TOTAL 1B	341.19	108.13	179.57	628.89

COMPONENT 2: PREPARE THE REDD STRATEGY

2a. Assessment of Land Use, Forest Policy, and Governance

A. Rationale and Context

Assessment of land use, forest policy, and governance aims at helping the country identify the main drivers of deforestation and/or forest degradation and assess past national experiences in reducing deforestation and forest degradation, in order to identify promising approaches to the incipient REDD strategy. This assessment should provide data on land use and other trends, as well as key elements of lessons learned, challenges, and opportunities. The REDD strategy should then be accurately developed to address the drivers of deforestation and degradation identified in the assessment. It should be designed to address the challenges of previous under-performing programs.

About 12 million ha of natural forests in Madagascar were lost between 1960 and 2000, with an effective reduction of the forest cover by 50% in only 40 years (World Bank, 2003). The total area is estimated at about 9.725.000 ha[18] in 2005. The annual deforestation rate is currently around 0.53%. Studies on forest trends used the following definition of a forest: height of 5m, surface > 2.5ha, and cover at 80%.

The deforestation trend warrants the development of a REDD+ strategy to reduce emissions and prevent impacts of future causes of deforestation and degradation, including those related to the national development process.

About half of the Malagasy natural forests are located in the eastern range, forming a corridor of dense rain forests. The other half of natural forests, mainly dense dry forests, spiny forests, and mangroves, is distributed more loosely in the northern, western, and southern parts of the country, with more significant forest ranges in the south-western and southernmost parts of the island (figure 6). The main artificial forests are located in the Central High Plateaus. The majority of natural forests belong to the State. Private property is limited, with some exceptions for artificial forests.

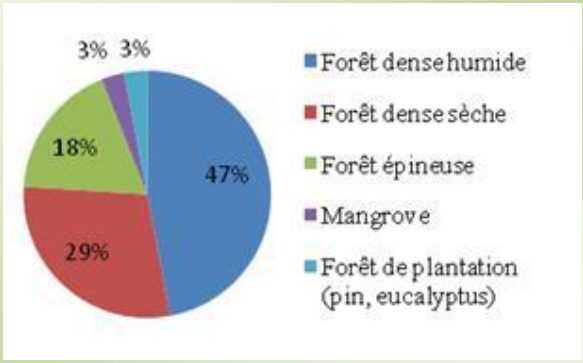


Figure 6. The main types of forest ecosystems in Madagascar

Conservation of forest resources is based on four strategic directions: (i) protection within the System of Protected Areas of Madagascar (SAPM); (ii) community-based management; (iii) sustainable management in the KoloAla areas; and (iv) restoration of degraded forests and reforestation. These directions were institutionalized by inter-ministerial order 18 633 of October 17, 2008, defining spatial distribution: about half of all natural forests, or about 5,248,922 ha, are located in protection-designated areas while the other half, or about 6,690,808 ha, are allocated to sustainable production. This national vision will be refined using Regional Land-Planning Schemes, integrating all stakeholders at the level of each region.

[18] *MEF - USAID and CI (2009) : Évolution de la couverture des forêts naturelles 1990 – 2000 – 2005, Madagascar. The natural forests areas are provided by the forest cover assessment done by USAID and Conservation International in 2007, while data on plantations are derived from the 1996 National Forest Ecological Inventory.*

B. Land-use and the causes of deforestation and degradation

B.1. Land use and tenure

Tenure in Madagascar is based on the state ownership principle: the State owns vacant or unregistered lands. The only recognized and guaranteed property is the private property derived from a registration procedure after valorization by actual, obvious, and permanent personal hold for at least ten years, after which it can be considered an appropriation. This system was not able to massively secure the farmers' rights to the land. After more than a century of the state ownership principle, barely 15% of the territory has been registered[19]. Customary tenure rights continued to survive and evolve influenced by population, economic, and social factors, and outside of tenure legality. At the edge of forests, forest conversion for agriculture is the valorization method practiced by households, to gain both legitimate ownership and recognition of personal holding[20].

Impacts of tenure insecurity on deforestation are noted at two levels. Ensuring forest tenure security is rarely legal to the eyes of tenure laws and is not respected by the local populations. Clearing to extend agricultural lands are common even in forest stands that are clearly part of the State forest estate (classified forests, forest reserves) and cannot be controlled by relevant administrations.

In contrast with customary rights and local practices, tenure management inherited from colonial times is a source of insecurity for rural populations, as they would not sustainably valorize their plots. For most rural populations, the forest range is first and foremost a stock of farmable, cultivated or pasture lands, before harvesting, logging, or collection of non-timber forest products. Ecological and environmental functions and services are obscured by immediate vital needs. Clearing and slash-and-burn practices create some form of soil appropriation. Population increase and migration trends significantly increase pressure on forests and increase clearing in some regions.

B.2. Deforestation and forest degradation

B.2.1 – Deforestation and causes

Between 2000 and 2005, the annual deforestation rate was estimated at 0.65% for unprotected forests and at 0.12% for protected areas. From 1990 to 2005, deforestation decreased (from 0.83% each year for 1990-2000 to 0.53% annually for 2000-2005). During this timeframe, deforestation rate in rain forests decreased by half (from an annual rate of 0.79% to 0.35%), while a significant decrease was also noted for dry forests (from 0.67% yearly to 0.40%). This was not the case for spiny forests, where there was a slight increase of deforestation (from 1.19% annually to 1.23%). The highest deforestation rate is noted for western and southern lowland. The tapia forest is a specific ecosystem of the high plateaus and the Midwest. It is affected by significant human pressures leading to degradation and deforestation.

Forest conversion for agriculture

The main cause of deforestation in Madagascar is the clearing of forests for agriculture (*tavy*). Accurate recent data show that from 1990 to 2000, 1,620,000 ha of forest were lost, (Steininger et al, 2003) mostly for agricultural conversion. Clearing of eastern rain forests is mainly due to subsistence agriculture, and lands are left after 2-3 years of production. A secondary formation replaces the primary one. For REDD+, these areas are not lost as they represent interesting carbon pools.

In addition to subsistence agriculture practiced by migrants, clearing in western and southern dry and spiny forests is due to commercial agriculture carried out by affluent individuals for the national market and the Indian Ocean islands. Due to the slow rate of ecosystem recovery (World Bank, 2003), conversion of these cleared areas can be considered irreversible. These biomes have registered the highest clearing rate of the last two decades.

Uncontrolled expansion of small-scale and illegal mining

[19] *The individual registration procedure is done in 24 stages, with an estimated average cost of $276 and requiring sometimes more than fifteen years (National Tenure Program)*

[20] *In addition to reality and obviousness, recognition of appropriation requires that the land is held for at least ten years, a timeframe that does not apply to slash-and-burn practices.*

Madagascar has important mineral resources spread throughout the country. Many deposits have been identified including industrial minerals (graphite, chromium, quartz, mica, coal, ilmenite, nickel, cobalt, etc.), decorative stones (marble, celestite, corindon, ammonite, etc.), precious stones (ruby, sapphire, emerald, beryl, etc.), quarry, gold, and hydrocarbons. While in 2002, mining activities represented about 4% of the GDP, the government of Madagascar plans for a value of 30% in 2012 if all existing reserves are exploited.

Currently, illegal mining activities directly contribute to deforestation and forest degradation. Eastern rain forests are the most impacted. In addition, the mining administration has very limited means to address these illegal activities and enforce existing laws. Management of rushes faces the same challenge. Efficient management would require more important resources. The creation of the Inter-ministerial Mining-Forests Committee helped address or reach a consensus on most conflicts.

Figure 7: Deforestation map of Madagascar between 1990-2000 and 2005

B.2.2. Underlying drivers of deforestation

Fast population growth

Rapid population growth, estimated at 2.8 % annually, is the main factor contributing to a significant increase of the demand for subsistence and cash crops. Combined with poor soil management in non-forest areas, population growth leads to migration in forests with richer soils. This is the case for the western part of the eastern rain forest corridor (migration from the highlands), the Sambirano area (migration from the south and south-west regions) and the western and northern dry dense forest (migration of Antandroy and Koraho). Free access to resources (and to forest lands) heightens the impacts of population growth on deforestation.

Unsustainable agriculture

In order to increase production, farmers must expand their lands. As productivity of old clearings rapidly decreases due to the quick loss of soil fertility, expansion almost always takes place on forest lands, involving new clearings. This trend is further heightened with production of some cash crops, sheltered from the authorities as these products are prohibited (sugar cane for production of a local spirit, unauthorized tobacco, and hemp). Stagnation or reduction of agricultural productivity has been noted for several years under traditional agricultural systems. According to a 2009 FAO[21] report, the agricultural production index per person has continuously decreased, from a high level of about 131 between 1979 and 1981 to 91 in 2003 before a slight increase to 96 in 2004. Efforts to improve

[21] Rapport spécial - Mission FAO/PAM d'évaluation de la sécurité alimentaire à Madagascar, août 2009.

productivity generally focused on relatively accessible areas, i.e. in areas rather far from the main forest ranges.

Poverty and precarious livelihoods of households

80% of households are poor and 80% of poor households live in rural areas: the further from urban centers and supervised areas people live, the more precarious their livelihoods are. The only sources of household income include agriculture, use of forest lands, and extraction of forest products. With very little links to markets, they receive very little assistance and have a very low level of education. They are extremely cautious with new techniques, however efficient they may be.

Lack of financial incentives for sustainable resources use

Households do not necessarily understand the reasons for forest preservation and its potential benefits. In their eyes, forests are potential agricultural lands. A mechanism of payment for ecosystem services is being currently developed.

B.2.3. Degradation and causes

There have been no specific studies on forest degradation (as meant by REDD+) in Madagascar. The degradation-fragmentation-deforestation cycle is increasingly observed as degraded forests are generally cleared later: clearing a fragmented forest is easier than a dense block. The main causes of forest degradation include unsustainable logging and pastures in forest areas.

Unsustainable logging

Logging is mainly extractive and loggers do not comply with management plans or reforestation provisions. Over the past years, a strong recrudescence of illegal logging has been observed, notably in the eastern rain forests where commercially valuable species such as rosewood are found. Logging is done anarchically (no respect for zoning, disregard of sizes). In addition, a strong increase of the international demand for precious woods has catalyzed the increase of illegal logging since the 2009 political crisis.

Forest pastures

Forest pastures contribute to degradation: it leads to livestock grazing and trampling on seedlings on passage areas, directly disturbing stands and preventing normal regeneration. This practice can also facilitate the introduction of invasive species by livestock. Extensive rearing techniques also include regular use of bushfires to renew pastures. Such practice can affect intact forest edges or even destroy degraded stands. In addition, forest pastures are viewed as a good practice against theft, as it is more difficult to steal livestock in forests than in hamlets and villages.

B.2.4. Underlying drivers of degradation

Political, economic, and social degradation

Repeated political and economic crises in Madagascar have always impacted forests. After losing their jobs, households usually opt for charcoal-making or illegal logging. The forest market is lucrative, notably with regards to the distribution of added values and earnings (Global Witness, 2009). Entrance barrier is high (logging requires a lot of money) but the predominance of informal activities leaves room for many people. The current logging trend for rosewood in the SAVA region is reputed to be linked to the 2009 political crisis.

Inefficient transformation industries

Harvesting and transformation of construction and service wood (COS - including precious woods) lead to a significant loss of forests. Less than 20% of standing raw wood is estimated to arrive on markets as semi-finished products (boards, beams, etc.) while the remaining 80% is lost during the production process (mostly in forests during felling and the first transformation). Therefore, meeting the demands for construction and service wood involves logging 5 or 6 times more wood with equivalent impacts on affected stands.

Lack of diversification and professionalization of actors

Despite an impressive development of management transfers (GELOSE and GCF) over the past years, the Forest Administration remains the main manager of forest resources. However, due to a lack of resources, the level of management of the Forest Administration remains inadequate. It is essential to strengthen management transfer to professional actors from the private and civil sector (private operators, NGOs, associations) and to Decentralized Territorial Collectivities. The forestry reform planned in 2002 defined the main sovereign responsibilities of the State and other actors (NGOs, operators, associations, etc.) with potential operational roles.

B.3- Cross-cutting causes of deforestation and degradation

Forest governance failure

Forest degradation is assessed separately in this R-PP, but is also due to governance failures on the legal framework and technical references for authorized logging as well as on the suppression of illegal logging and on law enforcement. Corruption trends of some agents weaken the governance of the sector.

Consumption of fuelwood

Based on estimated needs, the annual wood consumption reaches 21.73 million m^3/year, including 9.03 million m^3 of firewood, 8.58 million m^3 of charcoal, and 4.13 million m^3 of construction wood (Meyers *et al.* 2005). Household energy needs are covered at 90 to 95 % by firewood and charcoal, with a trend for consumption by households and other users in rural or urban areas, except for firewood in urban areas. Households are often forced to select the cheapest option and not the most energy-efficient or user-friendly, leading to a potential demand increase of forest resources over the next 10 years. High demands for charcoal exports could increase the level of resource extraction.

The eastern rain forests are mainly used for fuelwood, while there is a high pressure on the western and southern dry forests for charcoal production, leading to the disappearance of entire forest sections. Demand mainly comes from urban centers (sources of energy for household cooking and some local industries).

Various underlying drivers determine the level of impacts on deforestation of the use of forest resources for energy:

- Inefficient carbonization techniques with transformation rates rarely exceeding 15%;
- Losses and inefficiency of braziers. Despite the efforts of the PNEBE to reduce consumption by 30%, most households use traditional braziers due to their low purchasing power.
- Excessive prices of alternative energies compared to the average income.

Table7: Causes of deforestation and degradation by forest type

	Rain forests	Dry forests	Spiny forests	Mangroves
Ecoregions	East and Sambirano ecoregions	South, West, and North ecoregions	South and West ecoregions	West Ecoregion
Consulted regions	Alaotra-Mangoro, Analanjirofo, Amoron'i Mania, SAVA	Atsimo Andrefana, Menabe, Boeny	Atsimo Andrefana, Menabe,	Boeny, Menabe,
Deforestation	• Subsistence itinerant agriculture • Trails and roads • Mining	• Collection of fuelwood • Commercial agriculture	• Collection of fuelwood • Commercial agriculture	• Collection of fuelwood
Degradation	• Illegal logging	• Collection of fuelwood • Forest pastures	• Collection of fuelwood • Forest pastures	• Collection of fuelwood

B.4 – Analysis of the causes of deforestation and degradation by biome

Analysis by biome after regional consultations shows that the causes of deforestation differ from degradation. The assessment will be completed based on the type of land-use in forest areas.

B.5 Spatial analysis of the causes of deforestation and degradation

Based on the survey of known threats in the 22 regions, the geographic dominance of some causes is presented below, without being exhaustive. The figure on the following page summarizes the categories of causes and underlying drivers of deforestation and degradation.

Table 8. Analysis of the causes of deforestation by region

				Causes					
REGIONS	Deforestation 90-00 (%/an)	Deforestation 00-05 (%/an)	Decrease deforestation % /an	Agricultural Conversion	Bushfires	Forest fires	Illegal logging	Charcoal making	Mining
Alaotra-Mangoro	0.97	0.37	0.6	✓	✓		✓	✓	✓
Amoron'i Mania	2.77	1.49	1.28		✓		✓		
Analamanga	1.68	1.04	0.64		✓		✓		
Analanjirofo	0.59	0.14	0.45	✓			✓	✓	✓
Androy	0.62	0.66	-0.04	✓	✓		✓	✓	✓
Anosy	0.47	1.02	-0.55	✓	✓			✓	✓
Atsimo-Andrefana	1.19	0.98	0.21	✓	✓		✓	✓	
Atsimo-Atsinanana	1	0.54	0.46	✓	✓			✓	
Atsinanana	1.13	0.56	0.57	✓			✓		✓
Betsiboka	0.45	0.29	0.16			✓	✓	✓	
Boeny	0.91	0.4	0.51			✓	✓	✓	
Bongolava	0	0.05	-0.05						
Diana	0.62	0.52	0.1	✓	✓		✓	✓	
Haute Matsiatra	2.22	0.07	2.15	✓	✓				
Ihorombe	0.27	0.24	0.03	✓	✓			✓	✓
Itasy	7.49	6.66	0.83						
Melaky	0.22	0.2	0.02	✓					
Menabe	0.51	0.6	-0.09	✓			✓		
Sava	0.31	0.12	0.19		✓		✓	✓	
Sofia	1.04	0.3	0.74	✓	✓	✓	✓	✓	
Vakinankaratra	2.72	4.09	-1.37						✓
Vatovavy-Fitovinany	1.5	0.24	1.26	✓			✓	✓	

Source: USAID/JariAla (2009). Étude sur l'évolution de la couverture de forêts naturelles à Madagascar

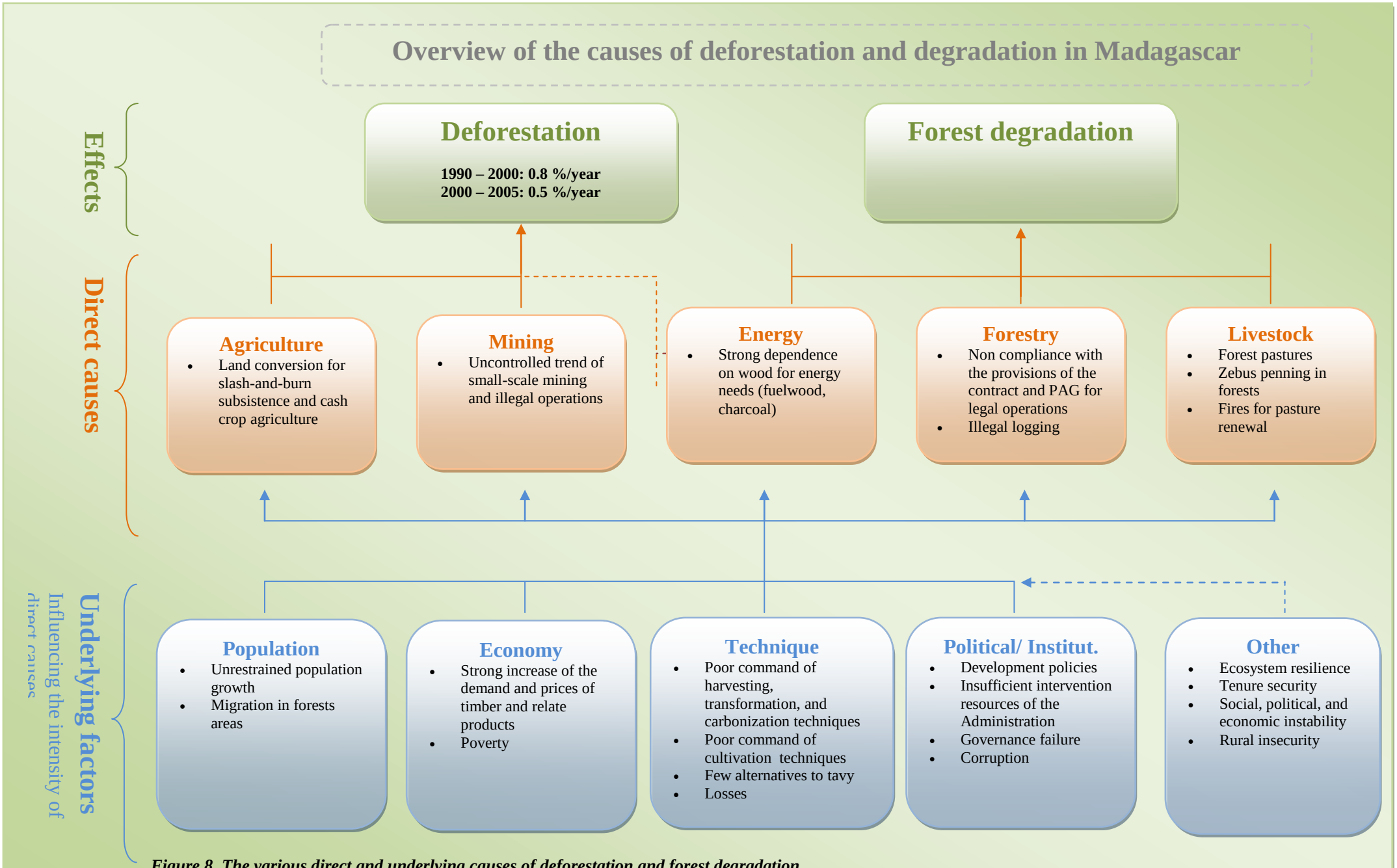


Figure 8. The various direct and underlying causes of deforestation and forest degradation

C. Sectoral policies and measures against deforestation and forest degradation

C.1. The Environmental Charter

Created in 1990, the first version of the Environmental Charter aimed at halting the cycle of environmental degradation. Two key degradation aspects are recognized in the charter: land degradation (soil erosion) and decrease of forest cover. It served as a reference for the PNAE and as a funding mobilization channel for the environment and biodiversity. The current results on the reduction of deforestation are due to the environmental program, mostly to its "Protected Areas" component. A steering committee is currently working on revising the Charter.

C.2. Environmental policy

The environmental policy is the reference for environmental management in Madagascar. It presents a global vision, setting the actions against climate change as a national priority and viewing the state of the environment in the perspective of the lack of environmental actions.

C.3. Forest policies

The main reference for the current forest policy is the Law on Forest Legislation (August 1997) with the Forest Policy as its main enacting decree (September 1998). This policy is derived from the observed strong degradation (in the broadest sense) of forest resources, decline of the public administration authority, lack of accountability of actors, and insufficient valorization of the forest economic potential.

Fundamental principles and main directions

This policy is based on six fundamental principles: i) accordance with the national development plan; ii) conservation of forest resources through adequate sustainable management; iii) minimization of ecological risks; iv) contribution of the forest sector to economic development; v) empowerment of local actors in managing forest resources , and vi) adaptation of forest-related actions to the country's conditions. The main directions aim at halting the forest degradation process, improving management of forest resources, increasing the forest area and potential, and enhancing the economic success of the forest sector. The fundamental principles and the main directions are consistent with the environmental policy adopted by the country, with the ultimate goal of halting the environmental degradation cycle.

Decentralization and participatory resource management

Both aspects play a special role in the current forest policy. Decentralized management of forest-related actions include devolving the administration, setting up goals by region, and involving regional and local sectors in resources management. The meaning and the extent of this involvement are detailed in the local and participatory management framework for forest resources: all or part of the forest management authority is transferred to local collectivities to enhance responsibility. Management transfer is a key element of the forest strategy under a wider system of local management of resources initiated under the PNAE. Therefore, tackling deforestation and degradation is one of the main directions of the current forest policy. Participatory management of forest resources is a legal way to achieve this.

C.4. The Code of Protected Areas

This is a law on the management of protected areas, mostly terrestrial. The associated biodiversity is mainly found in primary forests. The Code has made provisions for specific sanctions to penalize clearing in protected areas and degradation of core areas (tree cutting or animal mutilation). Implementation of the Durban Vision (to triple the surface of protected areas of Madagascar) led to the revision of the Code to integrate governance systems including neighboring populations among others and providing for a partnership with private entities. The law was amended in 2008 and specifically

focuses on man, biodiversity, global nature, aesthetics, morphology, culture, for a multiform protection in the interest of all.

C.5. The Action Plan on Rural Development (PADR)

Adopted in 1999, the PADR is a framework to design, define, and guide rural development strategies and programs in Madagascar. The main objectives are to: i) ensure food security; ii) help improve economic growth; iii) reduce poverty and improve rural living conditions; iv) promote sustainable natural resources management, and v) promote training and information to improve rural production. This Plan takes up the sectoral assessments in the forest and environmental sectors, taking into account specific issues related to rural development.

C.6. The tenure policy and the National Land Planning Policy

Tenure policy

Madagascar initiated an extensive program called the National Tenure Program to solve the tenure crisis. This new tenure policy aims at developing tenure management that is conducive to private investment; agricultural production; management, protection, and recovery of natural resources; development of decentralized collectivities with provision of land and tax planning tools; and enhancement of social cohesion at local and communal levels.

The tenure policy is based on three strategic directions:

- **Restructuring, modernization, and digitization of tenure and mapping -** improving the quality of public services provided to users (tenure title holders and buyers of estate lands) through revision, update, and digitization of tenure and mapping material.
- **Decentralization of tenure management** – provision to Communes of a local legal and institutional system (communal or inter-communal tenure office) able to deliver and change a document guaranteeing tenure security (tenure certificate). The existence of mapping documents (PLOF[22]) on land status and establishment of Local Survey Commissions are among the enabling conditions to open a tenure office.
- **Revision of tenure and estate regulations** – adjustment of laws to the new estate and tenure system based on decentralization, regularization of an old legal status that is not applicable today to the actual land use and management, and legal support for the use of new computer technologies.

The National Land Planning Policy

The PNAT was developed in 2006, integrating natural resources management in its strategy directions for more efficient territorial management. The main objective is to rationalize and improve natural resources management and valorization, by integrating the environmental dimension in all land planning actions, for all sectors, and at all levels. Therefore, the current policy recommends the effective application of existing regulations on environmental management.

The objective is to rationally manage and use natural resources while offering a good living environment in populated areas (towns and suburbs, big and smaller cities, hamlets, villages). The current system takes into account forests (including reforestation) and protected areas (including future protected areas under the Durban Vision) both for the current physical assessment and for committed areas. While REDD+ is not mentioned as such in any of these policies, reducing deforestation and degradation is an integral part of the main policies in Madagascar.

C.7. The Policy on sustainable development of coastal and marine areas

The policy on sustainable development of coastal areas is derived from the socioeconomic and ecological importance of coastal areas, long marginalized despite their considerable opportunities for

[22] PLOF: Local Tenure Plan

development. It is based on the assets and potential of Malagasy coasts, the economic context, the legal and institutional framework, the environmental issues in coastal areas, and the need for sustainable development and implementation of the integrated management of coastal areas (GIZC). It was developed based on a substantial dialogue at regional and national level. The decree 2010/137 of March 23, 2010 on the regulation of the Integrated Management of Coastal and Marine Areas in Madagascar was promulgated for this purpose.

This policy aims at promoting sustainable development of coastal and marine areas with the implementation of integrated management. Therefore, it involves a participatory planning process and integration of all areas, sectors, and relevant administrative levels. It is based on the numerous local and regional experiences in the country and takes into account other experiences in the world.

Since the implementation of the PEII, a task force named Commission-Environment-Fisheries was created, involving all stakeholders in both sectors. This commission was meant to be a platform for exchange and dialogue and a think tank to manage potential conflicts, to align interests for sustainable development. Over the past years, the GIZC has been placed under the authority of the Emergency Prevention and Management Unit (CPGU), a structure directly attached to the Prime Minister's Office, taking into account the ecological and economic stakes of coastal areas. Currently, the GIZC also examines the potential creation of marine protected areas.

C.8. The Mining Code

The new 2005 Mining Code further integrates the environmental dimension for the sustainable management of natural resources and biodiversity preservation in Madagascar, through the establishment of new protected areas. Any mining request will require an environmental impact assessment and an environmental commitment plan outlining the obligations of the permit holder. The Mining-Forests Inter-Ministerial Committee was created to better enforce existing regulations, at national and regional levels (see Chapter B-2.1).

C.9. The Water Code

Law N° 98/029 of January 20, 1999 institutionalizing the Water Code focuses on the Integrated Management of Water Resources (GIRE) and the implementation of a National Water and Sanitation Authority (ANDEA). However, regulations on the creation of ANDEA and its decentralized subsidiaries (Basin Agencies) were only adopted in March 2003.

ANDEA was placed under the authority of the Ministry of Water and created by decree N° 2009-192 of March 4, 2003, amended by decree N° 2007-508 of June 4, 2007. It is the designated entity to implement GIRE. It has an important mission as water is a strategic resource and affects all activity and investment sectors. ANDEA is in charge of developing planning and integrated management plans on water resources, based on the zoning of water basins.

D. Governance

In this R-PP, governance means all regulations, methods of application, and interactive processes affecting forest management activities.

Forestry in Madagascar has a long history. Knowledge goes back to the beginning of the 19th century during the reign of King Andrianampoinimerina [1787-1810], where destruction of forests, considered as a property of the King, was prohibited. Forests were the last resort for survival of the poorest. Queen Ranavalona II [1868-1883] promulgated the "Code of 305 Articles" (Published on March 29, 1881) including articles (101 to 106) on the access to and use of forest products, and making provisions for very harsh punishment for any forest destruction.

During colonial times (1896-1960), knowledge on forest resources improved partly through inventories by naturalists and researchers. Scientific research contributed to the creation of the first forest reserves for conservation. 12 Strict Natural Reserves, where any harvesting or exploitation was prohibited, as well as several forests classified based on their respective purpose, were legislated before the country's independence. This period was characterized by structuring of the forest service down to

the decentralized level with Forest Inspections, Forest *Cantonnements* and *Triages*; a police officer status allowed the forest service to file an official report for any forest-related offence. Logging for economic purposes in non classified areas actually began at this time. Finally, large-scale reforestation with eucalyptus, notably between Antananarivo and the Moramanga and Alaotra area, along the eastern railway, took place to support the railroad program.

D.1. Institutional framework

The forest sector has undergone numerous structural changes. Successive changes have certainly impacted assets, human resources, functions and funding of the supervising Ministry, and notably of the forest sector.

The Ministry of the Environment and Forests

Based on the principles and provisions of the Environmental Charter and the International Conventions on environmental protection ratified by Madagascar, the Ministry of the Environment and Forests is in charge of the design, coordination, implementation, and monitoring and evaluation of the State policy on the environment and forest resources. The Ministry of the Environment and Forests has the objective to "safeguard our unique environment and natural resources for the wellbeing of the Malagasy population and the sustainable development of the country".

The Ministry of the Environment and Forests exerts its authority on its subsidiary organisms, each under specific regulations and contributing to the management of the environment and forest resources: (i) the National Environmental Office (ONE); (ii) Madagascar National Parks (MNP) ; (iii) the National Association for Environmental Actions (ANAE) ; (iv) FANALAMANGA Inc. ; (v) the National Silo of Forest Seeds (SNGF) ; (vi) the National Center for Environmental and Forest Training, Studies, and Research (CNFEREF) ; (vii) the Organism Acting Against Marine Pollution by Hydrocarbons(OLEP) ; (viii) the National Environmental and Forest Observatory (ONESF) ; (ix) the Support Service for Environmental Management (SAGE).

Other sectors or inter-sectoral aspects

Environmental units are established within several ministries to align the visions of all sectors on the use and consumption of space, through the integration of environmental aspects in plans, schemes, and guidelines for development planning.

D.2. Management tools

Three aspects of forest governance are analyzed below: creation of legal tools, law enforcement, and forest data management

Legal tools

The main regulations on the management of forest resources in Madagascar include the Forest Law N° 97-017 of August 8, 1997, with the enacting decree N° 98-781 of September 16, 1998; enacting orders of the decree N° 98-782 on logging regime ; the decree on reforestation to "increase forest areas" (N° 2000/383 of June 7, 2000), regulations on secured local management N° 96-025 and their enacting decrees in 1998 on tenure security and in 2000 on environmental arbitration and on local communities.

Law enforcement

Enforcement of regulations related to forest resources management tends to fail. This is mainly due to the weak surveillance capacities of the forest administration, unable to enforce regulations due to a lack of material and human resources. In addition, there are provisions missing in existing regulations, notably on penalties against forest offences.

Forest data management

The Ministry in charge of Forests is responsible for forest information management. Therefore, it has a specialized service and uses advanced technology for geographic data processing. In general,

forest cover and deforestation data are more reliable than other information on forest use produced through a tracking system and fed with field data. ONE also manages environmental information and makes it available to the public. Information is directly produced from satellite images and reproduces some information, such as other sectoral information, from the various ministerial services.

E. Assessment of past efforts by the forest sector

The forest protection strategy in Madagascar was long restricted to the establishment of the national private estate, along with a repressive system on the use of forest resources. At the end of the 1980s, Madagascar committed to protect its environment, through the PNAE for 15 years, divided in 3 phases: the first phase (PE1) to establish the institutional framework, the second phase (PE2) to implement field work, and the last phase (PE3) to develop environmental reflex. With the support of partners, implementation of measures and institutional, financial, and technical frameworks led to a quantum leap. The objective was to tackle pauperization and to improve regional balance, in order to protect and valorize resources for sustainable development.

Table 9 below summarizes the results of actions against deforestation and degradation. Details are presented in the table in Annex 2a-1. Other sectors, such as energy, mining, transport, agriculture, and land planning took some initiatives with impacts on deforestation and degradation. From the assessment of management types (Table 10) and the results of regional consultations, the main governance issues to be addressed during the readiness phase include:

- Unbalanced responsibilities and resources of the Forest Administration
- Ineffective devolution and decentralization of responsibilities and resources, including to collectivities and local communities
- Law enforcement and inter-sectoral synergy
- Unreliable and unavailable information and data on forest resources
- Corruption

Table 9: Lessons learned from the various approaches on forest resources management

Actions performed	Lessons learned
Forest sector	
Protected areas: **Some protected areas in Madagascar (strict nature reserves) were established in 1920, and others since 1960. However, only when the Environmental Action Plan was implemented that the management of protected areas really progressed. Under its first phase (1991-1996), the integrative approach to conserve protected areas and develop outlying areas was developed.**	While there are concrete results on conservation of forest ranges, development of outlying areas was slower (and more expensive) and the alternatives were not really efficient. However, ecotourism can be viewed as a success and the revenue redistribution system (50% for the population as community projects) benefited the local population. Intervention sites became small development poles, increasing migration. In addition to conservation activities *per se*, projects funded some social development activities (so-called "entry points") in the beginning, and focused later on potential alternative activities.
Ecoregional approach for ecosystem conservation: **Another approach was developed under the second phase of the environmental program. It focused on the forest corridors linking protected areas, covering significant surfaces.**	Instead of directly funding revenue-generating activities or the type of alternatives defined under ICDPs, market approaches were developed and access to markets was facilitated. Activities were less concentrated but a reduction of clearing in the two main forest corridors was noted. The approach at least prepared the country for more significant conservation commitments (the 2003 Durban Vision) and opened doors for other forms of protected areas governance.
Management transfer: **Management of small forest areas (on average less than 300 ha) is transferred to local communities organized for this purpose (90 households on average). The initial system GELOSE includes a patrimonial negotiation based on the recognition of community rights on the land. The community keeps its usage right and regulates the access to resources.** A lighter type of transfer, the forest community management (Contractual Forest Management) was developed later.	Management transfer was supposed to be supported by a relative tenure security, but this did not have the expected success (overwhelmed tenure service). GELOSE focused on management transfer for all types of natural resources. The Contractual Forest Management, developed without patrimonial negotiation, focused only on forest resources, without tenure security or arbitration. The decentralized collectivity was not involved. In addition, regulations on management transfer lack clarity and were a source of abuse. A total of 500,000 ha of forests were under management transfer in 2004 (the total area to be transferred was 1,000,000 ha before the end of the PE3). The speedy creation of TGRNs without real support and capacity-building for local communities rushed the missions of the forest services, planned under the reform of the Forest Administration. Assessment of management transfers (Resolve, 2004) highlighted a decrease of land clearing and a higher empowerment of communities. It also noted the displacement of pressures to other areas (leakage). Currently, monitoring and renewal of contracts remain an issue due to the lack of assessment standards. The monitoring system still has to be developed (responsibilities, funding). Initially planned as a decentralization of resources management, the management transfer is finally a type of devolution (Resolve, 2004) of the responsibilities of forest services (surveillance and control).
Individual and industrial reforestation:	Individual reforestation differs from other forms of reforestation by its tenure security approach and the principle that an individual, and not the community, might benefit from reforesting. Industrial pine reforestation was done in the north-east (Fanalamanga) and central south (Haute Matsiatra) regions.
Community reforestation:	This is still in effect, mainly by the Forest Administration and some funding mechanisms (Tany Meva, etc.). A community receives support (technical and financial) to plant trees in its territory. While the actual planting is usually successful, support is not provided to maintain the plantations, poorly managed by the communities. The forest ownership issue (or the tenure question for the reforested area) is still pending.

Table 9: Lessons learned from the various approaches on forest resources management

Actions performed	Lessons learned
Reform of the sectoral management:	The main objective was to refocus the role of the administration, establish management transfers to regional actors, and develop forest sustainable management tools such as (i) establishment of KoloAla sites, (ii) traceability system of timber products, (iii) forest zoning, to help concerted allocation of lands on the entire territory, and (iv) streamlining of management systems for forest permits. This reform did not succeed due to diverging interests among decision-makers, excessive political interference in the administration, and lack of motivation of the administrative staff.
Conservation Agreements Initiated with partners (Conservation International, Durrell Wildlife, etc.) for several years in various parts of Madagascar. Conservation agreements are long-term actions providing sustainable solutions for the benefit of conservation and populations. They also enhance social structures and involve populations to become stewards of the key natural resources, in exchange of benefits to compensate for opportunity costs. Conservation actions are paid, either directly, notably for surveillance patrols, or as other in-kind benefits defined by communities.	Experience with the 13 Conservation Agreements in the Ankeniheny-Zahamena Corridor (CAZ) highlighted positive impacts in the field, with the enhancement of responsible behavior and motivation of populations with incentives for conservation actions. Therefore, this could be an efficient mechanism, both for REDD+ revenue sharing and for the monitoring and evaluation of deforestation/degradation. Reinforcement of conservation agreements introduces community monitoring of deforestation and degradation. Recommendations were developed to improve this approach (see Annex 2a)
Energy Sector	Studies and outreach efforts were carried out for the fuelwood sector. Activities focused on improving carbonization techniques and introducing more energy-efficient braziers. A major challenge is noted for this sector. Due to the free access to some natural forests, charcoal production remains uncontrolled and untaxed while it is still the main source of energy of Malagasy households, due to its better calorific value. Therefore, these initiatives contribute to the reduction of pressures on forests but do not halt deforestation and forest degradation.
OTHER SECTORS	
Mining sector	***The most important mining resources in Madagascar are mostly under forest lands***, leading to a permanent conflict between the two sectors. Damage is even more significant in the case of uncontrolled small-scale mining and illegal operations. Furthermore, uncontrolled development of small and medium-scale mining operations have further adverse effects. Large mining operations are more or less controlled with application of the MECIE legislation. In order to mitigate conflicts, the Inter-Ministerial Mining/Forest Committee was created to handle on a case-by-case basis all overlap issues of mining plots and forests.
Agricultural sector	Intensification of rice cultivation by SRI/SRA (Intensive/Improved Rice Cultivation System) was up scaled to improve rice production and reduce *tavy*. However, rice production on *tavy* is less expensive that in rice fields (Brand et al, 2002). Therefore, these techniques might not have the expected impacts on deforestation. Madagascar has promoted direct sowing techniques and agro-biological soil management, through GSDM which includes a research center (FOFIFA) and outreach NGOs (TAFA, ANAE, etc.). These mechanisms help manage soil

Table 9: Lessons learned from the various approaches on forest resources management

Actions performed	Lessons learned
	fertility and fight against erosion. Results are encouraging, notably in the supported areas (Highlands, Alaotra, etc.). These techniques have not yet reached the outlying areas of forests. Migration policies implemented in the Midwestern region were successful but rural insecurity is becoming an obstacle as new migrants are deterred by looters.
Tenure and land planning sector	The first outcomes of the implementation of the tenure reform are promising, as shown by the enthusiasm of communes, the positive reactions of the media, and the support of the government. However, the process is only at its inception and efficiency and equity of tenure management still remain to be seen. The main risk is the level of potential gaps between the initial standards of communal tenure management, even if they are similar to local practices, and the interpretations of these standards (abuse, favoritism, corruption, etc.). In addition, sustainability has not yet been achieved as the system still depends on external funding. Therefore, creation of tenure offices and legal reform start to be successful, but efforts should still be made in forests areas. Development of a land and habitat management plan is participatory and multi-sectoral, and will serve as a basis for all other planning approaches for land use in Madagascar. At the regional level, gradual implementation of the regional land planning framework, a variation of the SNAT, would reduce inter-sectoral conflicts. The SRAT should complement the existing regional forest zoning and both tools should support implementation of the local tenure plan. These principles should promote a favorable framework for REDD+ despite the uncertainties mentioned before.

A synoptic assessment of operations, based on effectiveness, efficiency, equity, and co-benefit generation criteria helps frame them better for REDD+. This assessment will be refined during the strategy preparation.

Table 10: Synoptic assessment of various approaches

Operation	Effectiveness	Efficiency	Equity	Co-benefits
Protected areas and ICDPs	Strong reduction of deforestation	High costs	Limitation or reduction of access to resources by the local populations	Water services, benefits of ecotourism, biodiversity preservation
Ecoregional approach	Low reduction of deforestation	Lower costs compared to protected areas	Preservation of population usage right	Water services
Management transfer	Low reduction of deforestation	Low costs	Preservation of population usage right	Rebates and royalties for the population
Individual reforestation	High success rate	High costs	Recognized ownership for the reforesting entity	Tenure security
Community reforestation	Low success rate	High costs	Recognized usage rights for the community	
Sectoral management reform	Improvement of governance framework	Average costs	Participation of population in decision-making and resources management	Diminution of corruption

F. Opportunities and constraints for REDD+

Opportunities for REDD+

Forest and development policies represent implementation opportunities for REDD+ (see Parts C and D). Other opportunities include:

Carbon storage opportunity: Recent studies (FORECA, 2010) based on the White classification showed that the average aboveground biomass of forests in Madagascar is estimated at 194.2 tons/ha (The IPCC reference for tropical forests is 194 tons/ha). More accurate assessment estimates the volume of aboveground biomass at 262.9 tons/ha for dense forests and 112.3 tons/ha for degraded forests (FORECA, 2010). Other studies (Rarivoariveloarimanana, 2001) found an average of 160 tons/ha. Therefore, the potential revenues generated by carbon sale are estimated at $356 per ha (Pavy 2002). It is obvious that these estimations are outdated.

Forest ecosystem services: Forest ecosystem services in Madagascar are significant in terms of production[23], regulation[24], and meaning[25]. The economic benefits of conserving protected areas and classified forests over fifteen years are estimated at about $57 million for ecotourism services, and $80 million for water services (Carret, 2002).

Biodiversity conservation: Madagascar is one of the Megadiversity countries. Terrestrial (mostly forest) biodiversity presents a very high rate of endemism and concentration : the island is one of the world's biodiversity hotspots and is home to 244 species of amphibians (all endemic), 370 of reptiles (92% rate of endemism), 98 species and sub-species of lemurs (all endemic), and 209 species of nesting birds (with a rate of endemism of 51%). About 12,000 plant species have been documented (90% endemism) including palm trees (194 species, all endemic) and baobabs (7 endemic species out of the 8 world's species) - (MEF, Rapport national CDB 2009).

[23] Production function: food, water for irrigation and consumption, medicinal plants, fuel, raw material for construction and craft

[24] Regulation function: regulation of streaming in mountainous areas, flood regulation, water catchment and restocking of ground water.

[25] Meaning function: esthetic, cultural, spiritual, and scientific values

Constraints for REDD+

There are four main constraints against the development of REDD+ in Madagascar: forest governance, overlap with mining, precarious livelihoods, and weak inter-sectoral synergies.

Forest governance: As detailed in parts D and E, forest governance is a main constraint for REDD+, given the slow development of an adequate legal framework and the wavering enforcement of existing regulations. The current number and distribution of forest agents are a major issue. The reform of the Forest Administration, planned under the Forest Policy (1997) is only beginning. Insidious corruption has negative impacts on the sectoral governance.

Overlap with mining: today, the mining administration is unable to effectively monitor and control the progress of small-scale mining and illegal operations in forest corridors. In addition, there is a potential overlap of potential mining areas and forest areas. Plot by plot negotiations take place when creating new protected areas. For a more global framework (REDD+), a mediation and compensation mechanism should be established.

Precarious livelihoods of rural households: poverty, lack of access to markets and services, insufficient sources of income, and subsistence economy compound the lack of knowledge and the persistence of detrimental traditions and customs. While this situation used to apply to households living near protected areas, upscaling of activities under REDD+ widens the challenge.

Weak inter-sectoral synergies: each sectoral administration has its own objectives and neglects relationships with or implications for other sectors, despite vision and strategy alignment efforts. The lack of compliance of the mining sector with tenure legislations is a perfect example. Forest resources always endure the setbacks of this situation. Tools to facilitate coordination and alignment of sectors, such as the Regional Land Planning Schemes are at their inception. In this configuration and to apply decentralization and devolution policies and strategies, the unclear distribution of roles and responsibilities between a sector's central and decentralized level and among various sectors, compounds the coordination failures of administrations.

Summary of success or risk factors for REDD+

Table 11 summarizes, but not exhaustively, the broad lines of the assessment of past successes and weaknesses, and opportunities and threats for REDD+.

Conservation International analyzed the main success factors of REDD+ and forest restoration, notably on partnership, technical aspects, funding, participation of stakeholders at local level, and government involvement, based on 12 ongoing projects in the world, including Madagascar. Recommendations were produced for forest carbon project developers to address issues related to the design, development, and management of REDD+ and restoration projects, and to improve the positive drivers for REDD+ (Harvey C. A. *et al.*, 2010).

Table 11: Summary of success or risk factors for REDD+

Success	*Opportunities*
• Creation of protected areas • Ecoregional approach for conservation • Management transfer and local empowerment • Individual reforestation	• New tenure policy • Positive forest policy for REDD+ • Importance of co-benefits
Weaknesses	*Threats/Obstacles*
• Community reforestation • Relative tenure security • Information management • Administration reform and refocus	• Forest governance • Overlap with mining • Precarious household livelihoods • Weak inter-sectoral synergies • Politicization of administration

G. Additional studies to expand the assessment

This review (Component 2a) highlighted the main drivers of deforestation and forest degradation. It also highlights the need for more thorough studies on some aspects, for the assessment to become a strong foundation of the development of the REDD+ strategy. There are four targeted studies:

- Vertical and spatial analysis of degradation and deforestation causes in Madagascar. Knowledge by area of variation will help define intervention directions to be implemented in the short and medium run.
- Assessment of the political economy of deforestation and forest degradation, to clarify and anticipate the main bottlenecks for reforms needed for REDD+. Outputs will inform the strategic environmental and social assessment.
- Assessment of efforts and international experience on the intervention directions. Based on the spatial analysis of deforestation causes, international experience should be examined to complete the analysis of intervention directions.
- Assessment of the economic contribution of the forest sector, to lead to comparisons on land-use types and their economic impacts.

Terms of references for these studies are provided in Annex 2a-2.

The gender aspect should be taken into account in the assessment and analysis of the following aspects, to produce a gender-oriented REDD+ strategy proposal:

- ✓ Activity profile including gender-based division of labor and the role of gender, as well as influence factors,
- ✓ Separate consideration of human activities (men and women) in deforestation and forest degradation actions,
- ✓ Change brought by regulations on labor division by gender to advance empowerment of youth and women and change men-women relationships in a forest society,
- ✓ Profile of access to and control of resources and benefits,
- ✓ Practical needs such as energy resources and strategic interests related to conditions and social status,
- ✓ Forms of power, including empowerment, and
- ✓ Access, notably of women and the most vulnerable sections of the society, to land and various development resources, taking into account the relevant legislations.

Table 12. Summary of assessment of land use, forest policy and governance activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Assess and classify actors in the timber sector based on their deforestation and forest degradation capacities	Identification and prioritization of actors based on the impacts of their activities on deforestation and forest degradation	3.00			3.00
Assess spatial distribution of causes of deforestation and degradation	Definition and identification of the most representative areas for deforestation	3.00			3.00
	Review and analysis of existing knowledge on the causes of deforestation and degradation	3.12			3.12
	Sampling and surveys at regional and local levels	45.11			45.11
	Data processing and analysis, extrapolation at national level	3.00			3.00
Analyze the political economy of deforestation and forest degradation	Typology of entities relevant for deforestation and forest degradation	1.60			1.60
	Review and literature analysis on the main challenges of deforestation and forest degradation	3.40			3.40
	Field surveys and research	45.12			45.12
	Data analysis, summary of results, and proposed recommendations	10.47			10.47
Assess efforts and international experiences on the intervention directions	Review and literature analysis, capitalize on the outcomes of national experiences	2.00			2.00
	Additional data collection and institutional consultation at different levels	19.80			19.80
	Research on international experiences	2.00			2.00
	Assessment and selection of intervention directions	27.67			27.67
Assess the economic contribution of the forest sector	Review of various existing economic studies and collection of base data for calculation	3.00			3.00
	Collection of additional information	5.26			5.26
	Development of assumptions, data processing, analysis and interpretation of results	4.40			4.40
	Assessment of prospects and production of recommendations	10.47			10.47
	TOTAL 2A	**192.42**			**192.42**

2b. REDD+ Strategy Options

A. From project to national approach

The Atlas of the vegetation of Madagascar (Moat & Smith, 2007) used the White classification (1994) on primary formations (18% of the territory), degraded rain forests (9.8%) and dry spiny forests (almost 1%). Including degraded forests, the potential forest area for REDD+ represents 28.8% of the country or about 17,000,000 ha.

The significance of deforestation and forest degradation was recognized decades ago, leading to the implementation of many mitigation measures (Component 2a). Tackling deforestation and degradation is not restricted to forest policies: the main directions of sectoral policies aiming at sustainable management of forest ecosystems, biodiversity conservation, participatory management, poverty reduction, as described under Component 2, helped select a series of strategy options during the consultation process for this R-PP. Intervention directions are suggested under each option, taking into account the outcomes of REDD+ pilot projects. The Makira project progressed on benefit sharing and community involvement in implementing deforestation and forest degradation mitigation actions. The Ankeniheny Zahamena Corridor and the Ambositra Vondrozo Corridor in the East focused on the governance aspect at local level and the use of carbon revenues for REDD-related development actions. The REDD-FORECA project developed methodology approaches involving the local level to determine drivers of deforestation, incentives, and governance structure. Annex 2b-1 shows the location of pilot projects and Annex 2b-2 outlines the lessons learned from their implementation.

B. On the use of strategy options to develop the REDD+ strategy

The strategic options are provisional: they were derived from analysis of sectoral policies of the last decade, deforestation and forest degradation factors and stakeholder consultations. Each option contains a non-exhaustive list of intervention direction which will be deepening either through the process of preparing the REDD+ or in partnership with ongoing activities and programs. This approach will allow to raise the level of mainstreaming of REDD+ in the sectors concerned and ownership at national and regional level.

The various options and intervention direction will be subject to thorough feasibility studies to assess assets, weaknesses, and contributions to address the main drivers of deforestation and degradation. Such studies will confirm or infirm proposed options and combine the best elements, using several scenarios, for a preliminary strategy. Finalization of the REDD+ national strategy will follow several stakeholders dialogue and consultation phases at local, regional, and national levels. An implementation framework based on the national strategy will be developed under the next component (Component 2c).

Intervention directions will be detailed through assessments of feasibility, impacts, costs, and early actions based on existing partnerships. Their combination will lead to the development of the REDD+ national strategy, to be implemented at 2 levels:

- ✓ A national level among the relevant sectors, under the form of policies, strategies, regulations, etc. This aims at ensuring a long-term sustainable framework for REDD+;
- ✓ A regional and inter-regional level through implementation of spatialized strategies, as priority actions for predefined high potential areas. The objective is to promote fast implementation in the short and medium term.

Figure 9: Development steps of strategy options

C. Summary of REDD+ strategy options

Sectorial policies analysis and stakeholder consultations helped select three provisional and interdependent strategy options on the main drivers of deforestation and forest degradation through consultations and discussions with stakeholders. The REDD+ national strategy in Madagascar will be based on:

- Improving forest governance,
- Managing access to forest areas, and
- The development of alternatives to deforestation and forest degradation.

Strategy Option 1: Improve forest governance

This option addresses the defaults of forest governance, source of law violations, non-controlling illicit holdings, the failure of forest controls and inhibition of creative initiatives that might potentially enhance sustainability of resources use. More coherent action of governance at all levels is to seek resolution constraints at the level of administration in carrying out its functions and membership of civil society and the private sector in sustainable building resources.The following intervention directions should be developed in order to better evaluate the relevance of this option on REDD+:

- Enhancement of ongoing reforms of the forest governance through the Revision and alignment of some forest regulations with actual conditions (category definition of timber, etc.), strengthening controls institutional support of the administration in the implementation of sustainable management of forests (zoning, traceability, plan, planning and management, transfer management) tools.
- The establishment of an effective system of information on forest management and the strengthening of the fight against corruption through consolidation of the independent intelligence and control bodies as ONESF, the CSI, the ONI, BIANCO, etc. This axis will be the subject of partnership with other sectors.
- The reinforcement of delegation / deconcentration of forest resources management by integrating civil society and industry private in planning, decision and enlarged sector; monitoring devices community forests defined for REDD+ and clarifying roles and local in the consideration of small players motivated management process strengthening mines.
- Transversal integration of the REDD+ level strategic documents mining sectors, increasing agricultural development infrastructure, transport and justice for the appropriation of other sectors.

Strategy Option 2: Manage access to forest areas

A sound strategy should address the issues related to the free access to forests and forested lands. This strategik option aim to analyse the maintaining existing carbon stocks through the improvement of forested population livelihood and the management of forest lands access. Particular attention will be given to the management of potential negative impacts of the development of forest zones (unauthorized migration, tenure conflicts, etc.) Appropriation of forest lands viewed as an access to production capital, due to low investment costs (in terms of work time and production resources), high demand for wood and non-timber forest products, illegal logging, and inefficient transformations should be eradicated.

The main intervention directions to be developed under this option include:

- Planning and regulation of access to forest areas over the demarcation of the forests for REDD +; maintaining forest in local and regional plans of development and use of space and support for households in edge of the forest land securing. Deepening this axis will be in partnership with the property sector and regional development to benefit reform achievements.
- The maintenance of the stock of existing carbon through the increase of the area of protected areas land and forestry production potential and current; increase forest cover by reforestation and restoration of degraded areas and vegetation fires fighting; restructuring of the sector wood and the professionalism of the sector through the empowerment investment sector actors private. This axis will be done in partnership with the private sector and national financial institutions.
- Deepening the differentiated management and access to natural resources by the inclusion of marginalized groups of young people, women and migrant approach without land along with vulnerable in General.

Strategy Option 3: The development of alternatives to deforestation and forest degradation

The precarious of livelihood limit rural household's choices in affecting their production capital and investments. They're obliged to subsistence economy by producing foods in close land. Low productivity of traditional system drive them to extend their agriculture field to the detriment of forest. Energy is a key element of degradation and deforestation. Projections of firewood consumption show that the use of wood is unavoidable for rural households. To improve the precarious livelihoods of households, the following intervention directions will be developed under this option:

Optimization of agricultural areas bordering forests through support and accompaniment of rural in edge of forests in sustainable increase and maintain the fertility of soil, increased by the use of improved seed production, promoting efficient and sustainable agricultural techniques and local funding to encourage the settling System Pack development agriculture production systems. This axis will be implemented in close collaboration with agricultural sectoral programmes in strengthening the agricultural sector policy and planning implementation. A partnership shall be also sought with micro finance institutions.

- In support of local community development, income REDD + should allow increased income from forest resources management for the benefit of forest people in areas with strong pressures. This through the development and promotion of environmental services payment mechanism, enhancement of biodiversity by ecotourism conservation and diversification of the economic valorisation of non-wood forest products.

- Diversification of energy resources through the development of incentives for reforestation and energy oriented in particular; promotion of alternative energies to wood sources; improving the efficiency of production and consumption of wood fuels, especially coal. This axis will be done in partnership with the energy sector and the national scientific research institutions.

D. Links between strategy options and causes of deforestation and degradation

Table 13 outlines the links between the causes and underlying drivers of deforestation and degradation analyzed in part 2a and the strategy options. Options are established for discussion and consultation to develop the strategy *per se*. They can be used to refine the content and location of activities.

Table 13. Strategy options and the causes and drivers of deforestation and forest degradation

Strategy options	Causes and drivers of deforestation addressed	Causes and drivers of degradation addressed
Improve forest governance	• Forest conversion for slash-and-burn, subsistence, or cash-crop agriculture • Development policy • Governance failure • Corruption • Poverty	• Forest pastures • Illegal logging • Violation of contract and PAG provisions for legal logging • Tenure security
Manage access to forest areas	• Forest conversion to agricultural lands for subsistence and cash crops • Uncontrolled expansion of small-scale mining and illegal operations • Migration in forest areas	• Strong dependence on wood for energy needs (firewood, charcoal) • Fires for pasture regeneration • Forest pastures • Illegal logging • Zebus penning in forests
Development of alternatives to deforestation and	• Excessive growth rate • Poverty and precarious livelihoods of households	• Violation of contract and PAG provisions for legal logging • Illegal logging

forest degradation	• Forest conversion for agriculture (*tavy*) • Poverty • low performance of, wood transformation, and carbonization techniques • Lack of command of agricultural • Lack of alternatives to *tavy*	• Strong dependence on wood for energy needs (firewood, charcoal) • Low consideration of marginalized groups

E. REDD+ strategy development process

With better knowledge on the causes of deforestation under Component 2a and strategy options proposed as references under Component 2b, development of the REDD+ strategy of Madagascar will be based on:

- Consultation of all relevant or affected actors at all decision-making stages, and
- A series of assessments and analyses to define strategy options to be implemented on one hand, and to develop needed tools and capacities for REDD+ strategy implementation on the other hand.

The process includes 5 steps spread over three years.

Step 1: Detailed assessment and analysis of each intervention direction

After the spatial assessment of deforestation, the list and features of intervention directions will be refined and detailed. Each intervention direction will be analyzed in detail using the three simultaneous studies below. Terms of references for these studies are provided in Annex 2b-3.

- **Assessment of impacts and potential benefits:** define to what extent each intervention direction will actually affect the reduction of emissions from deforestation and degradation. Direct impacts and potential benefits will be assessed based on a spatial distribution of opportunities for reducing deforestation and degradation. The objective is to classify intervention directions based on the level of efficiency and to identify priority areas for implementation.
- **Feasibility assessment of implementation:** assess the feasibility of each intervention direction by identifying main socioeconomic, political and institutional risks related to their implementation according to application areas, to determine needed revisions, adjustments, or enhancements to ensure success.
- **Costs and benefits assessment:** assess costs (investment, opportunity, and transactions costs) and benefits for each intervention direction to compare related economic costs and benefits in their specific areas.

Step 2: Selection of efficient and sustainable strategies

Selection of strategies will be based on an iterative assessment of advantages and drawbacks:

- Comparison, then selection of intervention directions under each strategy option. The main criteria include feasibility, costs, necessity, and performance.
- Combination of the best intervention directions among the various options, for the best synergy. Several strategy combination scenarios will be developed.
- A comparative analysis between scenarios followed by prioritization. Without being exhaustive, the main stratification criteria include: impact on deforestation, performance of the established framework, provision of a better vision to address deforestation, effects at various levels, and realism of measures.
- Discussions should be iterative with key actors during the selection process.
- At the same time, environmental impacts assessments will be carried out to identify unsolvable bottlenecks. In this case, other acceptable scenarios must be established.

Step 3: Specific studies

Additional studies will be done on selected and technically acceptable scenarios to gather additional information affecting their feasibility and sustainability. Without being exhaustive, the main studies include:

- Assessment of integration in and impacts on sectoral programs,
- Analysis of sustainability options,
- Analysis of management arrangement needs at both national and decentralized levels,
- Analysis of the monitoring and surveillance system of the proposed strategy mechanism.

Terms of references for these analyses are found in Annex 2b-4

Step 4: Finalization of the REDD+ strategy

At least two sustainable scenarios including accepted strategies will be recommended. One will be selected through consultation of key actors. The related REDD+-strategy is developed at two levels:

- At national level, building the long-term framework for REDD+, and
- At decentralized level, specifying the spatial intervention directions, to be implemented in the short and medium terms.

National level

The strategy defines the REDD+ management framework. It includes:

- Policy aspects, in terms of declaration and inclusion in sectoral directions and visions ;
- Legislative and regulatory directions;
- Integration in other sectoral programs and projects;
- Prioritization of areas for REDD+ implementation;
- Direction and commitment to ensure sustainability of the process; and
- Terms of reference for the management, monitoring, and control arrangement.

Regional level

Intervention directions will be developed for the key areas with a high level of pressure and representing a potential area for REDD+.

Step 5: Creation of operational conditions favorable for REDD+ strategy implementation

Favorable conditions for the implementation of the selected REDD+ strategy will be specified. They are based on the following parameters:

- Specification of resources needs;
- Assessment of available capacities and capacity-building planning. Planning includes all actors;
- Development of priority tools for REDD+ strategy implementation:
  - Regulations for management arrangement,
  - References for data base tools (surveillance mechanism, national registry, etc.), and
  - Strategy development plan
- Negotiation with decision-makers and partners/donors to gather financial resources.

The final document will be produced and communication will take place at various levels for dissemination and ownership. Framework conditions will be established through formalization of reference material and designation/creation of the REDD+ steering structure in Madagascar.

F. Calendar and synoptic for the REDD+ strategy development

Madagascar should start implementing the R-PP in 2011 to be able to finalize a developed and concerted strategy at the end of 2013. The main institutional management arrangements will be established by that date.

Box 2. The main steps of the REDD+ strategy development

year 1	Definition of the 3 R-PP strategy options
	Detailed and spatial analysis of the causes of deforestation and degradation. The objective is to specify the "parameters" of root causes and underlying drivers of deforestation for each area type. General information will be disseminated to a sample of 100 communes selected from the 12 regions to be consulted, to gather feedback from the general public in collaboration with the PCP-REDD+ members. Outcomes will be structured and discussed at the level of the 34 most representative districts for REDD+, in terms of opportunities, leakage, biodiversity, and importance of the relevant population.
Mid-year 1	Based on this analysis, practically spatialized and characterized intervention directions will be established. They will be derived from the strategy options to be implemented. At the same time, discussions on the key principles of carbon governance will be initiated with all relevant actors following the previous approach: information and awareness to collect feedback at local level, discussions and proposals at district and inter-regional levels.
End year 1	Detailed analysis of feasibility and range of each intervention directions with 4 studies: impacts, costs, feasibility, benefits. This feasibility analysis will integrate lessons learned from the early actions implemented in 2011
Mid-year 2	Selection of the most promising and most efficient intervention directions, based on the assessment of outcomes and opinions of relevant actors. Several intervention directions can be combined to produce scenarios. Scenarios associated to safeguard measures will be cross-compared based on acceptability, performance, and feasibility.
Mid-year 2	Finalization of the implementation component (carbon governance, institutional framework, etc.) with relevant interventions.
End year 2	Development of the REDD+ strategy, based on an agreement with all actors, at two levels:
	• At national level, as policies, regulations, strategies, institutional arrangement, etc.
	• At spatialized strategies level, as programs to be implemented by area type. Strategies are short to medium term versions of the national strategy, to speed implementation based on the needs in the field.
Mid-year 3	Implementation of the main institutional arrangements to lead the implementation of the REDD+ strategy.

Table 14. Summary of strategy activities and budget

Main activities	Sub-activities	Estimated costs (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Adjustment of stratgik otpions and Development of the list of intervention directions	Development of the list of the most promising intervention directions based on deforestation causes	19.8			19.8
Detailed analysis of intervention directions	Evaluation of benefits and impacts of intervention directions	11.92	11.96		23.88
	Feasibility assessment of the implementation of intervention directions	23.96	11.97		35.93
	Assessment of economic benefits and costs of intervention directions	16.04	16.04		32.08
	Summary and compilation of assessments on intervention directions		39.99		39.99
Analysis of combinations (scenarios) of intervention directions	Development of strategy scenarios		25.77		25.77
	Costs and benefits analysis of scenarios		19.80		19.80
	Specific studies: collection of additional information, integration SEA, sustainability, monitoring system		39.99		39.99
Development of the REDD+ strategy	Development of REDD+ strategies. Development of spatialized strategies. Consultation. Integration of SESA aspects (mitigation, safeguard, etc). Negotiation at the level of decision-makers		40.06	20.00	60.06
	Assessment of national capacities, resources needs, proposal on capacity-building		22.02	22.02	44.04
Study for strategy implementation	Development Plan of implementation tools for strategies and reforms		25.90		25.90
	Preliminary studies on additional fund raising to finance the REDD system			20.00	20.00
	TOTAL 2B	71.72	253.34	62.02	387.08

2c. REDD+ Implementation Framework

The REDD strategy will be designed and implemented according to national development priorities, as mentioned above. In many countries, priorities are well established and the implementation framework might have already been developed. However, a REDD policy will require amending or completing the existing framework. This component aims at establishing credible and transparent institutional, legal, and governance modalities, potentially needed for the country to implement its preliminary REDD strategy options described in Section 2b, and to fulfill potential requirements under the future REDD regime. The implementation of REDD will be successful if stakeholders are confident that it has the capacity to ensure equitable and sufficient incentives for planned strategy options.

The current component focuses on the preparation and development of the REDD+ strategy implementation framework in Madagascar. It involves sectors and various actors involved in forest governance and land use.

The strategy aims at standardizing policies, coordinating initiatives at various levels in different sectors, implementation of spatialized intervention directions, and creation of a legal foundation for carbon governance. The implementation framework will take all these elements into account.

The key elements proposed below will be confirmed and refined based on (i) the results of targeted institutional studies, then (ii) future negotiations under the national readiness and management arrangement (Component 1a), as well as (iii) planned assessments under Components 2a, 2b, and 2d and consultations results (Component 1b).

The REDD+ implementation tends to a national approach under which the State can delegate part of its prerogatives for the management of REDD+ projects. Ongoing projects will be pursued and will provide lessons learned, while contributing to the definition of the REDD+ implementation framework.

A. Key principles of the implementation framework

a) **Results-based incentives**: Through the establishment of results-based incentives, the REDD+ strategy will make the needed investments to implement policies, support measures, and to create the national capacities for managing the REDD+ process.

b) **Transparency**: Information collection and processing will be done in a transparent way, mainly with regards to:
   - The results of various actors,
   - Activities through the monitoring system (see MRV),
   - Distribution, use, and management of funds, and
   - Social and environmental impacts of policies and support measures.

c) **Optimization of existing structures**: The institutions for the REDD+ implementation framework will manage information and funding flow for incentives and investments, as well as mediation mechanisms on inter-sectoral conflicts at technical, political, operational, and financial levels. The institutional foundation will be mainly based on existing structures at national, regional, and local levels.

d) **Efficiency and equity**: The efficiency and equity of the sharing of REDD+ potential revenues should be monitored, and results should be assessed in a transparent and regular way. Beyond the recognized usage rights, sharing of part of the generated revenues will also be based on the results of such assessment.

e) **Mainstreaming**: The REDD+ strategy should be integrated in a carbon-efficient national development framework. Development and implementation of the REDD+ strategy will require commitments from numerous actors and sectors at all levels.

B. The global institutional framework of implementation

Based on the principles mentioned above, establishment of the global institutional framework of implementation will be done in two phases:

- A preliminary vision of the framework,
- Based on the preliminary vision, a proposed governance institutional framework, including:
  - Inter-sectoral coordination and resolution of potential conflicts,
  - Sharing of responsibilities, and
  - Studies on the needed institutional and legal reforms.

Preliminary elements and options for a "carbon governance" framework will be presented in paragraph C.

Preliminary vision

The development process of the implementation framework should clarify the links between and the responsibilities of institutions and actors participating in the REDD+ strategy. The charter of responsibilities which will be elaborated, should include and potentially revitalize, all existing institutional structures, (including those created under Component 1a), as well as legal and regulatory framework related to REDD+.

- **CIME**: **strategic decision-making** function and mediation for unresolved disputes at the level of the National Monitoring and Mediation Structure described below (see remark on CIME under Component 1a).
- **National Monitoring and Mediation Structure**: implementation monitoring, linking REDD+ to the inter-sectoral decision-making process, **technical** planning and management function, as well as REDD+ coordination. This structure will also be in charge of addressing inter-sectoral conflicts, and bringing them to CIME if needed.
- Within the Directorate-general in charge of Forests, the **REDD+ Unit** (Component 1a) will be the official interlocutor of the National Monitoring and Mediation Structure. This unit will also provide CIME with the information it needs to make strategic decisions.
- **Management Unit**: daily and operational management function. Technical, financial, and administrative management by making funds available to beneficiaries, based on planning of the National Monitoring Structure and management of REDD+ funds and revenues. Details on management and REDD+ revenues are provided in Paragraph D, indentation (iii).
- As a cross-cutting link, a **Technical Monitoring and Information Management Unit (MRV)**[26].

Proposition of governance institutional framework

The final institutional arrangement for governance will be defined after the REDD+ strategy readiness process, to establish a "REDD+ governance" approved by all stakeholders. This governance framework will include coordination of REDD+ policies and initiatives, implementation of actions, the monitoring system, as well as required institutional and legal reforms. Various detailed studies will be carried out. Their terms of reference are found in Annex 2c-1. The final arrangement will be selected when the REDD+ strategies are designed and approved.

(i) Inter-sectoral coordination and resolution of potential conflicts

[26] The MRV is entirely addressed under Component 4

The following sectors are involved in the development of the REDD+ strategy: forests, agriculture, livestock, public infrastructures, transports, energy and mining, decentralization and land planning, water resources, etc. Therefore, establishment and effectiveness of CIME, the National Monitoring and Mediation Structure, and the REDD+ Unit will ensure:

- Consistency of the REDD+ strategy and other national priorities, and
- An existing mechanism for conflicts resolution.

ii) Responsibility sharing for implementation

The REDD+ approach should valorize existing capacities and experiences of various actors and organizations in Madagascar, currently involved in conservation and sustainable forest management. Delegation of responsibilities should be enhanced, for instance by reviewing existing models of transfer to local communities of natural resources management, as well as other forms of management delegation, including traditional management. Involvement of local communities is a core element of the reinforcement of existing structures. In response, recognition of their legitimacy and likewise of their accountability is a crucial factor for the success of responsibility delegation and transfer. Various gender aspects (minority or marginalized groups, women, youth, etc.) will be taken into account.

(iii) Studies on needed institutional and legal reforms

The following studies will be initiated and managed by the PCP-REDD+ during the preparatory phase:

- Assessment of the regulatory framework and design of the institutional arrangement;
- Adaptation of community management tools to implement the REDD+ approach, or development of adequate community tools;
- Development of a monitoring system (MRV).

Terms of reference for these activities are found in Annex 2c-1/ ToR 2c-1, 2, and 3.

Subsequently, the National Monitoring and Mediation Structure will manage the development process for required reforms.

C. First Elements and Options for "Carbon Governance"

"Carbon governance" includes:

- Carbon ownership;
- Funding allocation to finance the REDD+ strategy;
- Management of REDD+ revenues;
- Transparent revenue-sharing; and
- Studies and negotiations for carbon governance.

The final carbon governance framework will be developed through studies and policy decisions during the final phase of the REDD+ strategy preparation.

Elements of this framework should be validated by all stakeholders. Therefore, studies, assessments, and dialogue will take place to ensure the effective operation of the framework. Terms of references are found in Annexes 2c-1/ ToR 2c-4, 5, and 6, while current examples of revenue management and allocation, from experiences of pilot projects, are found in Annexes 2c-2 and 2c-3.

Forest carbon ownership

Any reform and clarification of forest carbon ownership should (i) prioritize alignment of customary rights and formal rights and (ii) be considered in the context of a wider tenure reform and clarification, notably to ensure the rights of local communities and prevent conflicts and adverse social impacts during the implementation of the REDD+ strategy.

Current delegation options (by the State) of carbon sales rights to developers (e.g. at Makira) should be further clarified to reassure potential private or public investors in REDD+ activities in Madagascar.

Box 3: Carbon ownership

Definition of carbon ownership should take into account the following elements:

- Compensation payments (for ecosystem services) and incentives are not necessarily directly linked to carbon ownership, especially if such payments are based on performance indicators other than emissions in tons of CO^2.
- The legal and formal carbon ownership aspect should be separated from legitimate rights, under a system of funding allocation and sharing of REDD+ revenues generated from the reduction of emissions. As mentioned above, actors committing expenses and contributing to required investments to implement the REDD+ strategy should be equitably considered for the same emissions reductions.
- The carbon ownership aspect can be based not only on tenure status, which is related to land ownership, but also to tree ownership on the land (ownership of the aboveground biomass).
- The role of rural communities should also be considered, taking into account the customary right ownership.
- Currently, there is no clear legislation defining ownership rights for forest carbon in Madagascar. The REDD+ strategy of Madagascar should establish this legal foundation, in compliance with (i) the national context and local realities, and (ii) existing international laws and conventions.
- The current situation on tenure uncertainty prevailing on most of the country should be considered. Customary rights – as opposed to official tenure titles – are one example. Also potential differences between a tenure "title" and a tenure "certificate" should be clarified.
- A more detailed analysis will be needed to assess the links between carbon rights and use of forest products under various management regimes: community forests, co-management systems, and forest concessions (KoloAla, management transfers, etc.), and others.

Allocation of funds to finance the REDD+ strategy

The REDD+ implementation strategy ensures the availability of sufficient resources for all required efforts and contributions by all stakeholders. Implementation costs and opportunity costs for various actors in all relevant sectors will be taken into account. To establish confidence and ownership of the REDD+ strategy for all stakeholders, all sensibilities will be taken into account to develop and manage the REDD+ implementation framework.

Details on the fund allocation system are found in Annex 2c-3.

Funding and REDD+ revenues management

Revenue-sharing experiences and methods from REDD pilot projects will be assessed. It should be noted that revenues from the sale of carbon credits by these projects, targeting the voluntary markets, have been very limited. This also applies to the effectiveness of revenue-sharing and monitoring mechanism. An assessment is required, including on the permanence of the reductions of emissions. Revenue-sharing mechanisms and experiences under community management tools could also inform the assessment. Similarly, tools developed by the Foundation for the Protected Areas and Biodiversity of Madagascar (FAPBM) to measure the results of various protected areas (effective conservation, financial management, etc.) can provide information on revenue-sharing mechanisms. Finally, revenue-sharing models and experiences in the mining and oil sector will also be assessed, as well as those used by Madagascar National Parks (MNP) for the national network of protected areas and other existing mechanisms in the country.

Various options for the financial management of the REDD+ strategy will be evaluated and compared during the preparation phase. Existing institutions involved in the funding mechanism, such as the FAPBM, the Tany Meva Foundation, the National Forest Fund and private investments funds will be assessed. Adaptation or creation of a new model could potentially be done. A combination of elements from these various options is a possibility.

It is important to note that some benefits that are not directly monetary, such as the results of research activities, should be considered and assessed during negotiations of revenue-sharing contracts. Figures and details describing these various mechanisms are found in Annex 2c-3.

For all options, integration of the other sectors should be facilitated, and a transparent financial audit system should be established. The following diagram presents an overview of the implementation arrangement and the carbon governance framework.

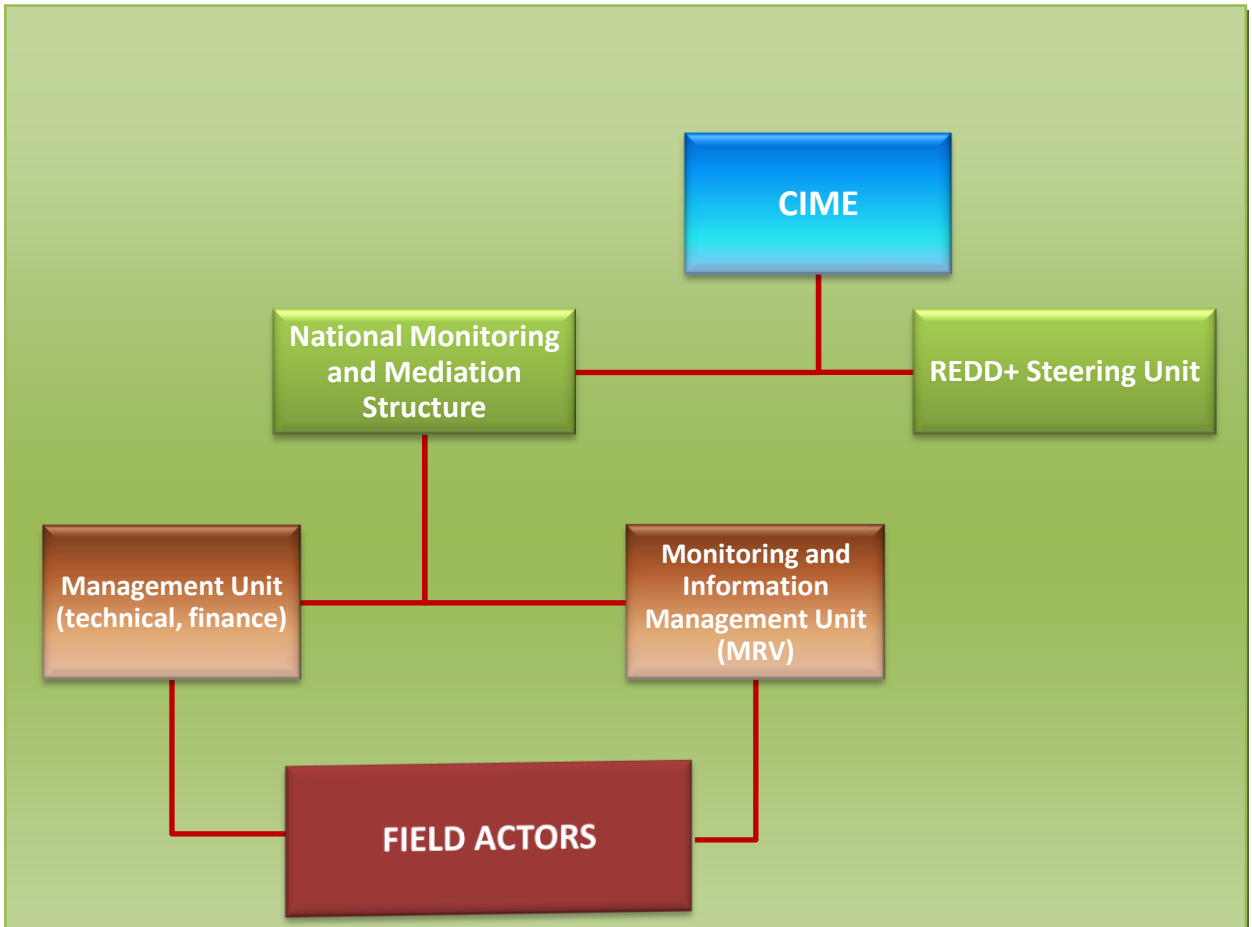


Figure 10: Implementation arrangement and governance framework for REDD+ in Madagascar

Transparency of the revenue-sharing process

During preparation of the national REDD+ strategy, mechanisms will be developed to ensure that revenue-sharing is efficient and transparent for all stakeholders. It is crucial that this process is verified and controlled independently (for instance, international auditors and REDD+ co-financing entities). The National Monitoring and Mediation Structure will also ensure that all stakeholders in Madagascar have access to information on received funding and generated revenues. Stakeholders will also be involved in evaluating the efficiency of revenue sharing and use, based on predefined indicators.

Studies and negotiations for carbon governance

The PCP-REDD+ will perform several assessments during the preparatory phase to recommend and negotiate the main elements of carbon governance. Planned activities (terms of reference in Annex 2c.1) include:

- Preparation of actors on carbon governance principles,
- Development process of carbon revenue sharing mechanisms, and
- Development of management and carbon revenue monitoring arrangement.

A separate series of activities will focus on supporting these studies and exchanges and negotiations with decision-makers, with workshops and missions.

D. Summary of steps to finalize the implementation framework

Table 15: Steps to finalize the implementation framework

Year 1	Year 2	Yea 3 ➔
- Identification and design of institutional arrangement - Studies on required institutional and legal reforms (Cf. Annex 2c-1/ First part ToR 2c.1)	- Creation of the coordination structure of the REDD+ strategy - Revitalized conflict resolution mechanism	- Developed charter of responsibilities - Functional structure - Established global institutional framework
- Assessment of regulatory framework -Identification of intervention directions - Coordination or REDD+ policies and initiatives (Cf. Annex 2c-1/ ToR 2c.1)	Acceptance of REDD+ governance by stakeholders	- Legal basis of REDD+ governance in place - Intervention directions ready for implementation
First development step of adequate community tools : -Dialogue - Assessment of pilot projects (See Annex 2c-1/ ToR 2c.2)	Valorize, design, and develop new adequate community tools	Adequate community tools in place
Design of monitoring system of drivers of deforestation and degradation (Component 4) (Cf. Annex 2c-1/ ToR 2c.3)	Valorize, improve	Exploitable system
- Studies for carbon governance: preparation of actors (Cf. Annex 2c-1/ ToR 2c.4)	- Propositions accepted and validated by all stakeholders - Reform - Preparation of actors and awareness and communication packages	- Functional carbon governance - Awareness and communication packages developed - Forest carbon ownership, clarified
- Assessment of possible mechanism of carbon revenue-sharing (Cf. Annex 2c-1/ TdR.2c.5)		Carbon revenue sharing process developed
- Comparison of existing financial management methods (Cf. Annex 2c-1/ ToR 2c.6)	- Evaluation of existing institutions - Potential creation or addition of institutions	Various financial management options for the REDD+ strategy

E. Budget

Table 16: Summary of implementation framework activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Studies on required institutional and legal reforms	Assessment of global regulatory framework for REDD+ strategies implementation. Regulatory assessment. Proposition of needed reforms. Design of institutional arrangement. Tor 2c.1		21.95		21.95
	Studies and prospects for the sustainability of the implementation framework (Tor2c.1)		6.27	6.27	12.54
	Design of adequate tools at community level for implementation (Tor2c.2)			15.70	15.70
	Proposition of monitoring system on strategies and variations of the causes of deforestation (ToR 2c.3)	2.40			2.40
	Support to and negotiation with decision-makers to formalize regulations on the new management arrangement			2.00	2.00
Studies on carbon governance	Preparation of actors on carbon governance principles: awareness on governance principles, publication of communication tools (ToR 2c.4)	2.00			2.00
	Feedback on carbon governance, associated with consultations during the detailed assessment of the causes of deforestation. Consolidation. Preliminary discussions with key actors.(ToR 2c.4)	6.46			6.46
	Analysis of carbon ownership. Proposal. Regulatory assessment for carbon governance (ToR 2c.4)	7.23			7.23
	Studies to develop the carbon revenue sharing mechanism, associated with the sustainability effort for the entire mechanism (monitoring, MRV, etc. ToR 2c.5)	11.63	23.26		34.89
	Development of a transparent management arrangement and carbon revenue monitoring. Institutional proposal. Regulatory proposal.(ToR 2c.6)		25.22		25.22
	TOTAL 2C	29.72	76.70	23.97	130.39

2d. Social and Environmental Impacts

A. Justification

This component aims at assessing the potential effects (both positive and negative) of REDD+ strategy options and the implementation framework identified in Sections 2b and 2c or to be identified during readiness efforts. The idea is that from the readiness phase, REDD should "do no harm" but "do good".

The Strategic Environmental and Social Assessment (SESA) is an effective tool to integrate environmental aspects in development strategies, policies, and plans. SESA helps ensure that environmental impacts are fully considered at the earliest stage of the process, along with economic and social factors.

Compared to the well-known Environmental Impacts Assessments (EIA), which are carried out at project level and therefore focus on the short term, the SESA allows for early consideration and better control of impacts, while widening assessments towards development. For the REDD+ strategy, the SESA provides retroactive recommendations for all approaches, in order to optimize consideration of environmental and social impacts of actions to reduce deforestation and degradation.

This SESA aims at integrating environmental aspects in the implementation of the REDD+ strategy, identifying, describing, and assessing significant and potential effects and interactions among environmental, economic, and social factors.

Therefore, the SESA will help to rapidly assess lessons learned from:

- Past experiences on efforts to reduce deforestation and forest degradation, and
- Experiences on REDD+- related forest governance.

It will also help better identify and assess potential REDD+-related activities as well as potential additional benefits (poverty reduction, biodiversity conservation, enhancement of political goodwill, etc.).

B. Context

The Madagascar Constitution requests that every citizen protects the environment. Two other main aspects are mentioned:

- The States provides for environmental protection, conservation, and valorization using appropriate means (Art 39)
- Communities (*Fokonolona*) can take adequate measures to counter any action that might destroy their environment, dispossess them of their lands, or monopolize areas traditionally affected to livestock or ritual heritage, without infringing on the common interest and law and order.

At this level, the primacy of local communities on land use is recognized. The Government of Madagascar adopted in 1990 its Environmental Charter, setting out three key principles:

- Environmental protection obligation: "*Environmental protection and respect are for the common good. Each and everyone has the duty to safeguard the living environment" (Art 4) ;*
- The right to information and participation of populations in environmental decisions: "*Any natural or legal person should have the possibility to be informed on any decision that might have an impact on their environment, either directly or through groups or associations. The person also has the possibility to participate in decision-making" (Art 4)*, and
- Required impacts assessments (in the global sense): *"Public or private investment projects that might affect the environment should be subject to an impacts assessment, based on the technical*

nature and extent of such projects and the vulnerability of the relevant location". (Art 10). Therefore, participation of populations in decisions affecting their environment is mandatory.

Legal framework for environmental assessment is defined by the decree for environmental compliance of investments (MECIE) [27] which requests that public or private investors perform an environmental impact assessment (EIA) when investments have a potential environmental impact, pursuant to the Environmental Charter. Three main principles can be highlighted: i) any plan, program or policy which might affect the natural environment or the use of natural resources, and/or the quality of the human environment in urban and/or rural areas is subject to an environmental impacts assessment (Annex 1 of MECIE); ii) the National Environmental Office (ONE) is the delegate implementation entity and sole office for the MECIE. ONE supervises evaluation of EIAs and coordination of compliance of environmental management plans, and iii) EIA definition (in the general sense): EIA is a preliminary assessment of predictable potential impacts of a given activity on the environment.

On the international level, the SESA requirement is based on development-related international agreements ratified by Madagascar. References include:

- The Paris Declaration on Aid Effectiveness, adopted on March 2, 2005 calls on development cooperation agencies and partner countries to define common approaches of environmental assessments in general and the SESA in particular.
- The SESA of sectoral plans and programs applies to programs supported by the World Bank.

While there is no recognized conventional framework on SESA, Madagascar has a wealth of experience on environmental assessments with smooth implementation of mechanisms since 1999:

- Regulatory framework (Environmental Charter, National Environmental Policy, Forest Policy, Environmental Program, etc.),
- Institution in charge of environmental assessments (ONE),
- Environmental units under ministerial departments,
- Decentralized territorial collectivities (regions, districts, communes), NGOs and consulting firms established with MECIE,
- Several management and environmental assessment tools have been developed and applied: guidelines and sectoral handbooks including for the forest sector. A SESA manual has been available since 2008. It was developed based on the fifteen or so implemented SESAs and performance criteria for SESA at international level.

For environmental assessments in general, there are hundreds of initiatives (policies, plans, programs, and projects), including fifteen SESAs.

For REDD+ in Madagascar, SESA will be carried out along the development of the REDD+ strategy to be most useful and relevant for the selection of adequate and appropriate intervention directions.

C. Safeguard framework

A national REDD+ safeguard framework will be developed, based on applicable and applied frameworks in Madagascar. References include the MECIE decree, the World Bank safeguard operational procedures, and the operational framework of national procedures on social safeguards in protected areas. The following table compares the evaluation process based on the World Bank process to the system applied in Madagascar.

[27] *Decree N° 99-954 of December 15, 1999 amended by Decree N° 2004-167 of February 3, 2004 on environmental compliance of investments (MECIE)*

Table 17: Features of the various assessment process types

Theme	World Bank safeguard procedures	National safeguard requirements
Concept	A series of assessments and participatory approaches to integrate environmental and social aspects in policies, programs, and plans	Assessment of preliminary environmental impacts of plans, programs, and policies to mitigate them at an acceptable level
Area of application	Any plan, program, or policy, for which a preliminary screening indicates a potential environmental or social impact (almost all PPPs)	Any plan, program, or policy that might modify the natural environment or the use of natural resources, and/or the quality of human environment in urban and/or rural areas.
Outline of terms of references		
References in SESA	WB Operational procedures, authoritative at international level	SESA manual, with references to global best practices
Consideration of populations affected by the project	WB Operational procedures: OP 4.12 on involuntary resettlement	Prevent, mitigate, or compensate negative impacts on populations
Consideration of natural habitats	Only usage rights of populations are allowed in natural habitats (OP 4.04).	Avoid irreversible cumulative negative effects on the environment Avoid to the extent possible impacts on natural habitats
Participation		
Evaluation of the impact assessment	All projects proposed for funding are subject to an environmental assessment (OP.4.01). Evaluation by safeguard experts from the World Bank.	Participatory assessment involving populations affected by the project and the public, and an *ad hoc* technical committee.
Strategy alignment	Adjust the strategy based on relevant points noted by the evaluation	Integrate the results of the evaluation in the strategy

The SESA should include a Social Safeguard and Environmental Management Plan (PGESS) with the objective of providing more information on challenges or concerns and identified impacts and measures in the environmental and the social and economic areas, with potential effects on the populations affected by the REDD+ strategy (PASR). This plan will subsequently serve as environmental specifications (*Cahier des charges environnementales* or CCE).

The SESA should include the following elements in its PGESS:

- Assessment of links between environmental, social, and economic issues and concerns, and their potential impacts, and REDD+ and the socioeconomic development of populations affected by the REDD+ strategy, so that planning is consistent with the principles of sustainable management, taking into account widespread, global, cumulative, and synergy effects.
- Detailed assessments of social safeguard mechanisms and measures.

The National Environmental Office will be in charge of developing a handbook on PGESS and its evaluation for the REDD+ strategy. The handbook will reflect approaches before, during, and after the development of SESA, with related activities.

D. Charter of responsibilities for strategic environmental and social assessment

Structures involved in developing the SESA include the Ministry in charge of the environment and forests, the National Environmental Office, and the PCP-REDD+.

The Ministry in charge of Forests

The Ministry in charge of Forests will be the SESA **instigator**. With support from the BER, it will finalize the terms of reference for the SESA to be presented to both the National Environmental Office and the World Bank for validation. Through its subsidiary departments and services, it supervises consultants' activities during the SESA development process. The Ministry should ensure integration of durability aspects and environmental and social stakes and concerns throughout the process. It is also in charge of the SESA results integration and consideration for REDD+ development. It will also be responsible for communicating on the SESA and the REDD+ strategy.

The National Environmental Office (ONE)

Based on the MECIE decree, ONE leads the evaluation of the environmental impacts assessment and the coordination of the Assessment Technical Committee de (CTE, including sectoral environmental units and the Ministry in charge of the environment). The same principle will apply to SESA. With support from the PCP-REDD+, ONE and CTE (i) will validate the ToRs for the SESA and (ii) evaluate and validate the preliminary SESA.

The REDD+ Readiness Coordination Platform (PCP-REDD+)

This structure is planned to replace the CT-REDD within the three years of R-PP process. The PCP-REDD+ will become part of the Evaluation Committee led by ONE. Its role is to ensure independent control of the implementation of the SESA process, to enhance equity and fairness.

The REDD+ Executive Office (BER)

The BER is the entity in charge of the technical and operational management of activities, in addition to ensuring implementation of SESA activities. The BER will determine provisions and arrangements based on the general planning for SESA.

The World Bank

The final version of the SESA will be evaluated by the World Bank.

Consultants

National consultants, with the support of an international consultant, will be recruited to develop the SESA. These consultants will be supervised by the Ministry in charge of Forests (with support from BER). The international consultant will also be in charge of capacity-building of various stakeholders involved in the SESA before the beginning of the study. Proposed areas for capacity-building are presented in Annex 2d-1.

Other actors

A number of other actors will be involved in developing the SESA. They mainly include other ministerial departments, territorial and traditional authorities, forest-dependent populations, populations directly affected by the REDD+ strategy, the civil society, the academic and research community, and REDD+-related nongovernmental organizations.

Table 18: Mandate and roles of SESA stakeholders

Entity	Mandate	Role in developing the SESA
Directorate-General Forests	• Applies the environmental and forest policies	• Guarantor of the REDD+ readiness process • SEA instigator • SESA supervisor
REDD+ Executive Office	• Manages the REDD+ readiness process	• Manages procurement aspects and finalization of terms of references • Manages consultants • Ensures the quality of the SESA development process (stakeholders' consultation, communication on SESA, etc.)
National Environmental	• Sole office for MECIE	• Validation of the ToRs for SESA

Office		• Validation of SESA framework • Coordination of the SESA CTE • Training on SESA • Evaluation of the REDD+ social safeguard and environmental management plan (PGESS)
World Bank		• Validation of the terms of references for the SESA • Evaluation of the REDD+ social safeguard and environmental management plan (PGESS) • Financial support • Methodology support to the process
Consulting firms / consultants	• Implementation of SESA based on terms of reference	• Development of the draft version • Development of the final version finale after evaluation

E. Public participation and consultation

There are two types of consultations:

- Consultations to prepare the framework (preliminary survey) and while developing the detailed SESA, initiated by the developer. This section is included in Component 1b of the R-PP, indicating both the R-PP and the post-RPP consultation plans,
- Consultations initiated by ONE with CTE during the evaluation stage of the detailed SESA.

Madagascar has a well-defined regulatory framework[28] on public participation in an environmental impact assessment process for an investment project. The same mechanism will be applied for the SESA evaluation by ONE/CTE. Steps for the process must include (i) an informative phase on the object of consultation and on the public consultation procedures themselves, (ii) a subsequent consultation phase *per se* to collect opinions of the relevant public, and (iii) an integration phase of the outputs of public consultation in environmental and social decisions. The type of public participation for the evaluation of the SESA, literature studies, public survey, or public discussions, will be determined by ONE/CTE.

[28] Order n° 6830/2001 of June 28, 2001 on arrangements and procedures for public participation in environmental assessment, pursuant to the MECIE decree and the Environmental Charter.

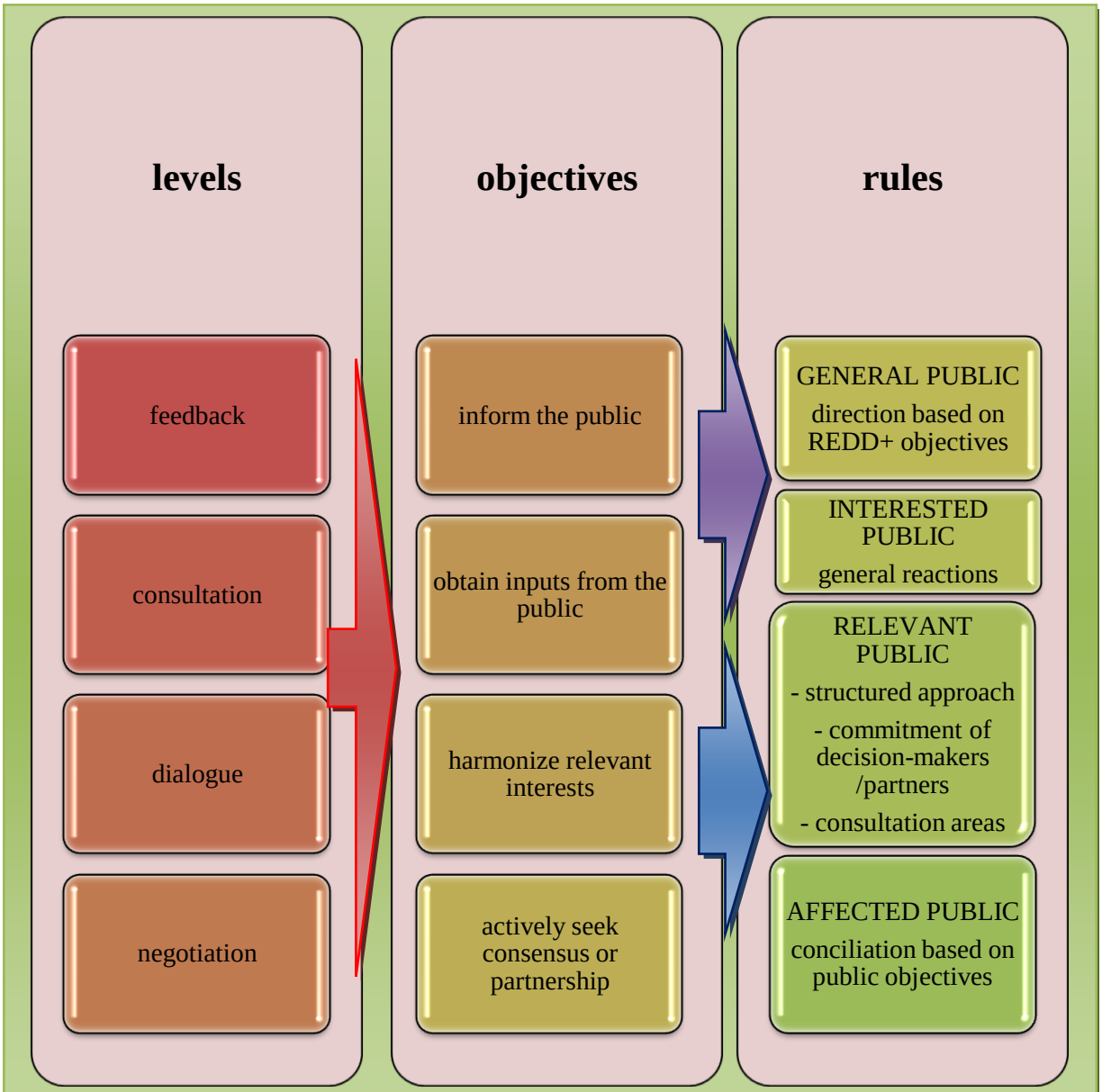


Figure 11. Levels of public consultation

Each type of consultation should include two simultaneous aspects:

- Institutional consultation which plays a very important role in SESA procedures, therefore creating the opportunity of implementation during the pre-feasibility stage
- Community consultation to collect opinions and needs of communities.

F. Terms of reference for the SESA

Assessments will be performed by national consultants, with the support of an international consultant and in close cooperation with governmental and non-governmental institutions. The three terms of reference below describe the four main steps of the SESA:

- The SESA framing, which is a preliminary study,
- Implementation of the preliminary detailed SESA,
- Finalization of the SESA, and

- Adjustment of the REDD+ strategy based on the SESA.

Terms of reference to frame the SESA

Objectives

This preliminary assessment aims at determining the potential impacts on the environment (bio-physical, social, and economic) of the REDD+ strategy options defined under Component 2b. This stage is not yet a quantitative assessment of environmental and social impacts of intervention directions.

Range of services

Consultants should (i) identify and evaluate the direct and indirect results of the implementation of the REDD+ strategy that is being developed, and (ii) consider the extent to which these results might impact any environmental asset (biophysical, social, and economic). Generally, consultants should understand the potential direct or indirect results of intervention directions defined under Component 2b:

- ✓ Interaction of results with the environment; nature and range of these environmental interactions;
- ✓ Mitigation of negative environmental impacts;
- ✓ Optimization of positive environmental impacts; and
- ✓ Remaining global potential environmental impacts of these intervention directions, after integration of all possible mitigation measures.

Based on these assessments, consultants should:

- Conduct surveys and an assessment of stakeholders directly or indirectly affected by activities under the REDD+ strategy and their implementation,
- Develop a detailed consultation plan to be initiated during the SESA process, so that such consultations are efficient and effectively influence decisions. Highlight the integration process in the SESA of the results of consultations;
- Clarify and confirm the objectives (and the content) of the SESA; define the methodology used to assess potential impacts, taking into account World Bank procedures; and define temporal and spatial aspects of the study;
- Initiate stakeholder consultations to gather opinions and concerns on intervention directions, and on their social and environmental impacts; integrate results in the adjusted ToRs of the detailed SESA and consultation plan;
- Develop a detailed plan for SESA implementation and the integration process of the results of the assessment and the strategy development process;
- Capitalize on existing data and information (R-PP document, pilot projects, information on protected areas, results of various studies and assessments under Components 2a, 2b, and 2c) related to the concerns on relevant environmental and social issues of potentially affected parties.

Deliverables

- Preliminary study report, including expected results described under “range of services”,
- Adjusted ToRs for the detailed SESA,
- Detailed consultation plan for the SESA phase, and
- The SESA implementation plan.

ToRs for the implementation of the preliminary detailed SESA

Objectives

- Define the relevant aspects of environmental and social situations, and the likely trends without a REDD+ strategy. Results of this approach can supplement the parameters to include for the development of baselines and reference scenario (Component 3) and vice versa.
- Identify, describe, and assess potential impacts on the environment (including social aspects) of the REDD+ strategy, to be taken into account during preparation and implementation.
- Suggest feasible measures to manage and/or mitigate these impacts.
- Support the Ministry in charge of forests to integrate these measures in the REDD+ strategy of the Government of Madagascar.

Range of services

- Establish a reference situation (in order to establish future changes by REDD+) by describing the environment and social aspects affected by REDD+ (including future activities and projects), based on intervention areas and other studies and analyses carried out in Components 2a, 2b, and 2c, as well as the reference scenario of Component 3. This aims at providing all base data on current environmental quality and socio-economic status of the relevant areas before implementation of the REDD+ strategy. Present likely trends without REDD+ and highlight social and environmental features of potential highly-impacted areas.
- Assess the legal and regulatory framework (environment component, including international conventions such as the CBD, etc.) institutional and environmental aspects and socioeconomic development policies in relation with root causes of deforestation and forest degradation or with REDD+ intervention directions.
- Confirm the compliance of existing tools (policy, legal, technical, structural, and organizational) for the sustainable management of forests and the environment (including social aspects) with the World Bank safeguard procedures, including on environmental assessment, natural habitats and biodiversity, indigenous peoples, displacement or resettlement, and forests.
- Initiate an identification and assessment of environmental and social opportunities and constraints. Environmental and social resources and factors potentially affecting (in a positive or negative way) efficiency, effectiveness and durability of the REDD+ strategy should be identified for each proposed intervention direction.
- Assess the significance of potential environmental and social impacts (including both positive and negative secondary effects; short, medium and long-run impacts, and permanent and temporary impacts) for each scenario. Assess the extent of social and environmental impacts while considering potential cumulative effects, inter-sectoral aspects of the REDD+ initiative, and the environmental or institutional capacity to react to direct or indirect impacts of this initiative.
- Assess the compatibility with land uses of each suggested activity and initiative under REDD+.
- Highlight expected environmental consequences based on the various sectoral policies, desirable changes, and social and economic effects.
- Identify and evaluate significant effects and potential environmental and social risks and influences from the REDD+ implementation for each identified scenario (at national level and for REDD+ areas – current and future). Identify and assess environmental factors affecting REDD+ objectives and other framework priorities (MDP, poverty reduction strategy, etc.). Significant impacts should integrate interests and concerns of stakeholders, socioeconomic consequences (specifically for forest-dependent peoples, indigenous peoples, and vulnerable and minority populations), and implications for sustainable development. This assessment would also cover REDD+ management and/or implementation structures (including execution and monitoring of reduction and mitigation measures identified in the SESA).
- Assess the causes of deforestation and degradation, including forest fires, referring to Component 2a on land use, forest policy, and governance.
- Evaluate the co-benefits of REDD+ and those created by the proposed strategy options.

- Establish the environmental and social management framework of the REDD+ strategy in order to define the environmental and social evaluation assessment process for REDD+ initiatives, projects and future activities. This process should (i) integrate both the Malagasy legislation, specifically the MECIE and environmental, social and forest aspects, and the World Bank safeguard policies, (ii) recommend a classification of required and applicable environmental assessment types for each strategy project/activity, and (iii) identify charters of responsibilities for the different stakeholders to make the environmental assessment process effective. Consultants would potentially make environmental recommendations for some types of specific projects/activities under the REDD+ strategy. They will also outline the implementation process of the safeguard policies (while taking into account economic feasibility).
- Suggest planned measures to prevent, reduce, and compensate as much as possible any significant adverse effect on environmental and social aspects. Measures should be realistic and economically efficient and will cover REDD+ coordination and implementation as well as implementation of each planned initiative, project, or activity under REDD+. Develop an implementation plan for these measures as well as a description of planned monitoring measures and indicators. Measures should comply with the national legislation and defined in accordance with World Bank procedures. Highlight the remaining global potential environmental effects of the REDD+ strategy after integration of possible mitigation measures.
- Conclusions and recommendations – This part summarizes the main environmental and social issues, constraints (policy, institutional, etc.), challenges, and main recommendations. Highlight the selected scenario, activities, and measures (including prevention and mitigation measures noted above) and describe the evaluation process including any difficulty. This part should also highlight measures and action plan to optimize the strategy and needed institutional capacity-building.
- SESA is an integral part of the REDD+ strategy development process. Throughout their mandate, consultants should take into account all approaches, methodologies, and results of analyses and studies by other components of the R-PP and specifically of Components 2a, 2b, and 2c based on the synoptic scheme. They will also conduct dialogue and exchanges with the instigator of the study, as well as with all service providers involved in the studies and assessments mentioned above.
- Highlight potential environmental impacts of other sectors directly or indirectly dependent on REDD+: (i) expected environmental impacts related to these other sectoral policies, (ii) desirable changes, and (iii) economic and social consequences.
- Highlight: (i) specific environmental implications of REDD+, (ii) institutional capacities and legal framework to appropriately manage links between REDD+ and other sectors, and (iii) environmental relevance of REDD+ indicators.

Deliverables

- Concrete measures with clear institutional responsibilities, to be integrated in the REDD+ strategy or in other policies related to REDD+.
- A preliminary strategic environmental and social assessment document to be validated by ONE and including a non technical summary.

ToRs for the finalization of the SESA

Following the evaluation of the preliminary SESA by ONE, consultants should integrate recommendations in the final report. The report will highlight:

- Key impacts of each intervention direction,
- Concerns and issues of stakeholders/groups of actors, and ways to inform stakeholders about the implementation of recommendations.
- A summary note on the approach, issues, and main concerns of stakeholders. Factors in favor of one intervention direction will be indicated and submitted to the PCP-REDD+.

G. Alignment of the REDD+ strategy

The SESA has the ultimate objective to align to the extent possible the REDD+ strategy with the existing best practices in terms of efforts against deforestation and degradation, to minimize negative impacts and optimize positive impacts, including co-benefits.

This strategy adjustment does not fall under the SESA process but under the general strategy development process.

To harmonize the SESA and the REDD+ strategy, the latter will be aligned based on recommendations validated during the preliminary study and finalization of the study on environmental and social recommendations and instructions on one hand, and on the consultation approach throughout the REDD+ process on the other hand, based on environmental and social instructions and recommendations in the SESA. The REDD+ intervention directions should also be adjusted.

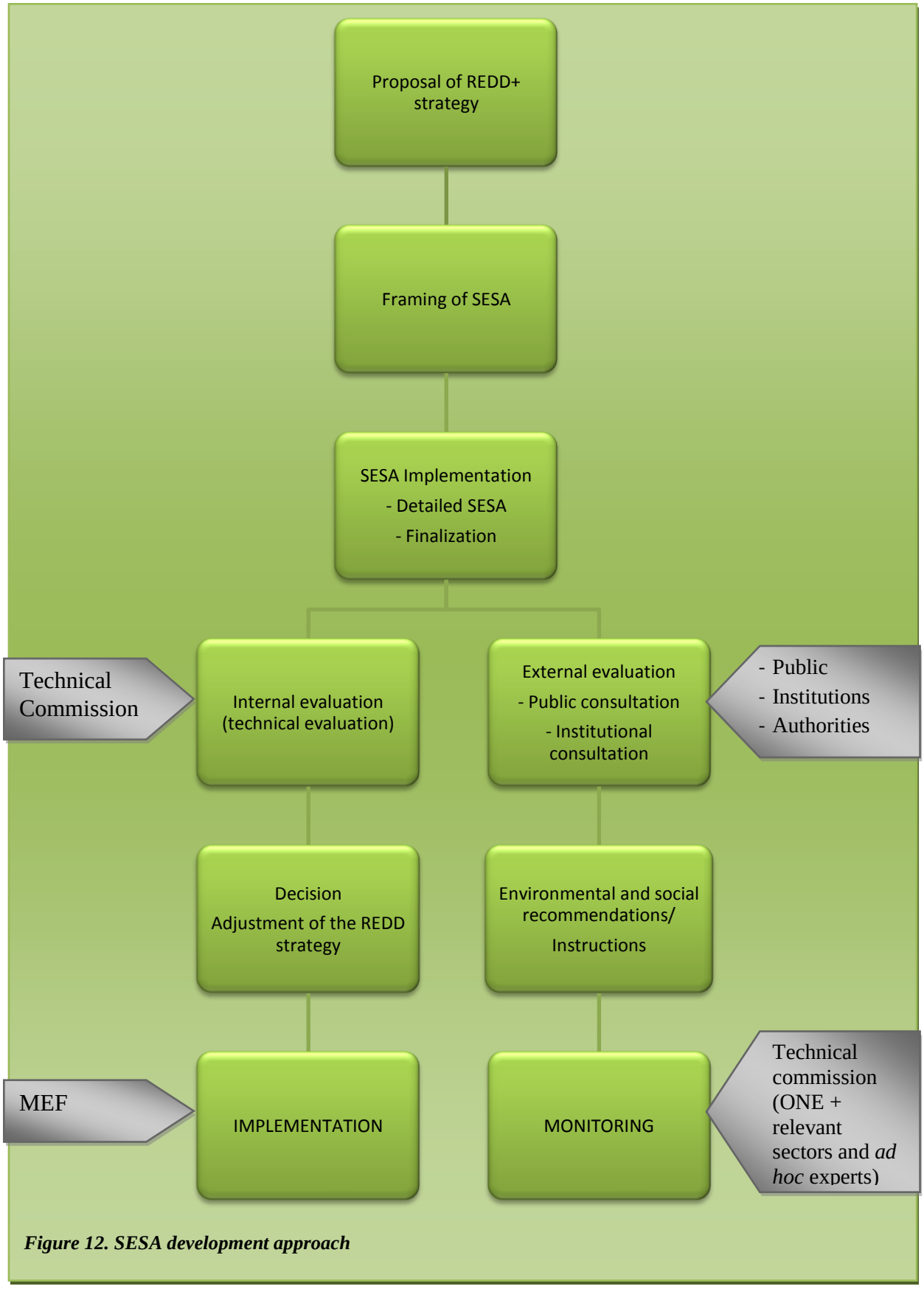


Figure 12. SESA development approach

Table 19. Summary of social and environmental impacts assessment activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Development of SESA tools for REDD+	Development of SESA guidance for REDD+	13.72			13.72
Capacity-building	Training of various stakeholders at central level	32.54			32.54
	Training of various stakeholders at regional level	24.95			24.95
SESA framing	Development of ToRs				
	Preliminary survey	10.47			10.47
	Adjustment of ToRs				
	Guidelines				
SESA implementation	Assessment of environmental and social impacts based on the REDD+ strategy	26.59	26.60		53.19
	Development of the detailed SESA and validation		12.24		12.24
	Finalization of the SESA		8.00		8.00
Evaluation of the SESA file	Technical evaluation by ONE/CTE		5.00		5.00
	Public evaluation		29.67		29.67
	Institutional evaluation		10.97		10.97
	Instructions and recommendations		1.25		1.25
	Communication of results		8.47		8.47
	TOTAL 2D	108.27	102.20		210.47

COMPONENT 3: DEVELOP A REFERENCE SCENARIO AT NATIONAL LEVEL

Justiication and context

A REDD reference scenario (i.e. a scenario of trends over time of the forest cover and related GHG emissions for a country) is defined here as a combination of recent historical data on emissions from deforestation and/or forest degradation and other relevant land uses, and estimations of future emissions and removals, to produce a national scenario over time of GHG emissions, without additional REDD incentives.

Madagascar subscribed to the fourth decision of Annex 2 of the Copenhagen Accord of December 2009, inviting signatory parties to refer to guidance in decision 2/COP.13, notably paragraphs 7 and 11. This includes identifying decisive factors of deforestation and forest degradation causing emissions, defining means to address them, identifying related activities, and implementing them based on national situation and capacities, and defining national sound and transparent forest surveillance systems. Aspects related to the temporal or chronological baseline defining a reference scenario will be discussed under this Component 3, to refine the REDD+ strategy and serve as foundation for consistent establishment of the monitoring system.

Estimation of historical emissions requires data on carbon stocks and changes where land use changes took place in a defined timeframe. This estimation will be based on remote sensing data, the IPCC good practices, and the results of 3 studies on forest definition, forest cover trends, and identification of variables causing deforestation and forest degradation.

A. Preliminary steps to define the reference scenario

A technical task force will be created under the authority of the BER, with the mission to steer the development process for the reference scenario and develop the MRV system. Its members will represent various technical departments/ministries and relevant research institutions with a technical profile. Prior to developing the reference scenario, the following data should be defined:

1- Definition of forest

The current definition of forest adopted in Madagascar under the CDM[29] excludes some forest formations such as southern spiny forests and mangroves. However, these are under increasing pressure from deforestation. As ONE, CI, IEFN adopted different definitions of forest based on their own objectives, forest areas varied among projects, as shown in Table 20.

Table 20: Forest areas over 3 time periods based on adopted definitions[30]

Source	Definition	Forest area 1990	Forest area 2000	Forest area 2005
CI	H=5m, 80% cover, 2.5ha	10,507,347 ha	9,755,305 ha	9,294,237ha
ONE	H=5m, 1ha		10,950,786 ha	10,737,367 ha
IEFN[31]	All types of vegetation taken together, no distinction for height or cover rate; 5ha	12,671,980 ha	13,895,135 ha	

Under the implementation of the REDD+ strategy, Madagascar will revise the canopy cover rate downward to integrate all forest types (spiny forests, mangroves, etc.). A cover rate between 15 and 20% would be optimal for the country for the following reasons: a cover rate below 15% would be a source of relatively significant errors in interpreting satellite images and a 20% would keep out many ecosystems. The two other parameters, i.e. tree height and minimal surface will be defined during the REDD+ strategy preparation phase, with a study on forest definition. The study will specify carbon

[29] *Height ≥ 5m, cover ≥ 30%,and area≥ 1ha*
[30] *Cartographie des écosystèmes de Madagascar (annexe 3-3)*
[31] *Forest area in the first column are from IEFN 0 (1996) and figures in the second column from IEFN 1 (2000)*

storage scale and capacity of each type of forest. Another study will complete data to specify the reference year, taking into account specific development factors for Madagascar (criteria, indicators, etc.) affecting the global scenario and the evolution of forest cover. Appropriate and relevant actions will be assessed.

The definition of forest will include all forest types. Madagascar has a great variety of forest formations, the six main ones being: rain forests, dry forests, southern spiny forests, tapia forests, mangroves, and artificial forests (pine, eucalyptus, legume, etc.). For each type, vegetation succession will be included in the national carbon accounting, notably *savoka* (including climax forests that had been degraded and degraded forests gradually returning to climax). Annex 3-1 shows the different regional areas by forest type from the ONE, RBG Kew (Royal Botanic Gardens Kew), CI, and IEFN studies.

2- *Methodology to estimate carbon stocks*

Various methodologies to estimate carbon stocks have been applied by REDD pilot projects in Madagascar. Table 21 presents the values of carbon stocks determined by each pilot project.

Table 21: Tons of carbon in the aboveground biomass defined by REDD pilot projects in Madagascar

Forest formation type	FORECA	MAKIRA	CAZ	COFAV	PHCF
Rain forests	209 to 308 tC/ha	286 tC/ha	220 tC/ha	260 tC/ha	ongoing
Southern dry forests	n/a	n/a	n/a	n/a	ongoing
Tapia forests	10 tC/ha	n/a	n/a	n/a	n/a

Discrepancies are due to the diversity of applied methods and forest types at each project location. A summary of these methodological approaches is presented in Annex 3-2. A national REDD workshop took place in Antananarivo in September 2009 to define the methodological elements to be adopted at national level. This workshop highlights the complementarities of the approaches and the need to capitalize on their results.

During the preparation phase, a standardized methodology for carbon accounting will be finalized. The main elements are presented in this document. At the end of the readiness phase, any future REDD+ project should use the standardized methodology. It will help base and determine the reference carbon volumes for the various ecosystem types in the country.

3- *Consideration of deforestation and degradation*

Studies performed by the Carnegie Institution in Peru show that emissions from forest degradation represent about a half (46%) of those caused by deforestation (See Annex 3-4). In relation with the study on forest definition, the most decisive variables will be refined to develop a definition of deforestation and degradation as well as degradation thresholds, in terms of carbon stocks and canopy cover rate. Currently, deforestation is understood as a land-use change (a forest is transformed into a non-forest area), leading to a virtually complete loss of carbon in the aboveground biomass. Degradation leads to a decrease of carbon stocks and of the canopy cover, without any land use change (the forest remains a forest).

B. Development steps for the national reference scenario

Development of the reference scenario will follow three steps to achieve the highest level of precision (Tier 3): assessment of historical deforestation, determination of the current carbon stocks, and modeling of future trends of carbon stocks under different scenarios (economic, development, etc.), capitalizing on the results and experiences of pilot projects.

Step 1: Assessment of the historical deforestation in the country

Several projects have monitored forest cover in Madagascar. Based on their objectives, they applied different criteria and produced different results. For instance, the results of the Jariala Project, aiming at assessing the effectiveness (or not) for deforestation reduction of the creation of protected

areas excluded forest blocks below 2.5 ha. This is due to the fact that processing of satellite images was based on relevant criteria for intact or virtually intact forests: height> 5m, canopy cover at 80%, and minimum area of 2.5 ha.

Assessment of the historical deforestation will be conducted for the entire country using LANDSAT images for 1990, 1995, 2000 and 2005, and if possible images from 2008, 2009 or 2010. The new analysis will include forest degradation as a complement to the usual forest loss. The tools that will be used need to have the capabilities to detect changes in forest canopy cover. Use of the CLASlite software has already been tested successfully in Peru and is already being used in Madagascar; based on successful result in one of the pilot project (WWF's PHCF). Other similar software will also be considered should CLASlite encounter difficulties, especially for challenging ecosystems like the spiny forests in the southern part of the country. These software should all be capable of detecting changes in forest degradation. The result will be a national map of past deforestation and degradation between these various periods and for each forest type.

Experiences and outputs of other projects will also be integrated such as the Environmental Modeling in Madagascar (IRD), modeling land-use changes in the Fandriana-Vondrozo Forest Corridor (COFAV).

Step 2: Determination of the current forest carbon stock in the country

This is crucial step for the REDD+ mechanism. Efforts will aim at providing a reliable and usable reference on forest carbon stocks in the country.

The determination approach of forest carbon stocks will include four sub-steps: selection of carbon pools, analysis of satellite imagery, estimation of aboveground biomass carbon stock, and development of allometric equations. During carbon stock evaluation, measurement plot system will be established in the field. Results from these measurement plots will be used to calibrate the other techniques used (remote sensing and allometry)

(i) Carbon pools

Some pilot projects (MAKIRA, CAZ, and COFAV) included litter and dead wood as carbon pools, but due to a lack of data, results are not widely applicable to all ecosystem types (all measures took place in the eastern rain forests). The below-ground biomass has not been measured by any of these projects due to the complexity of the protocol. Experimentation will be done during the preparation phase to estimate carbon stocks in this pool for the various forest formation types and biomes. Analysis will also be done in each biome to evaluate the below-ground/aerial biomass ratio. Results will be compared to the figures in the IPCC guidelines (See table below): if results are similar, the usual conversion factor from the IPCC Guidelines for National Greenhouse Gas Inventories will be applied.

Table 22: Ratios of below-ground and aboveground biomasses based on the 2006 IPCC Guidelines for National Greenhouse Inventories– Agriculture, forestry, and other land uses

Area	Ecological area	Aboveground biomass	Ratio underground-aboveground biomass	Ratio interval
Tropical	Tropical rain forests	<125 t/ha	0.20	0.09 – 0.25
		>125t/ha	0.24	0.22 – 0.33
	Tropical dry forests	<20 t/ha	0.56	0.28 – 0.68
		>20t/ha	0.28	0.27 – 0.28
Sub-tropical	Sub-tropical rain forests	<125 t/ha	0.20	0.09 – 0.25
		>125 t/ha	0.24	0.22 – 0.33
	Sub-tropical dry forests	<20 t/ha	0.56	0.28 – 0.68
		>20 t/ha	0.28	0.27 – 0.28

Source: REDD Sourcebook. GOFC GOLD.

Soils carbon has been rarely studied in Madagascar; only one study has mapped the soil carbon throughout the country (Grinand *et al*, 2009[32]). Most studies are on a regional level only but they can serve as preliminary references. Examples include studies conducted by the PHCF pilot project on soil carbon in the northern and southern parts of the island (underway). The fluctuation of soil carbon content is assessed based on the aboveground vegetation succession. Results on variations of soil carbon under forests and agricultural lands will help determine if soil carbon should be integrated at national level.

Currently, the aboveground biomass remains the main carbon pool to be considered for the national carbon accounting.

(ii) Analyses of satellite images

Analysis of satellite images will help select the type of images (high or very high resolutions) to use for the national stratification.

Experiences from efforts related to forest stratification in Madagascar and from REDD pilot projects recommend the use of very high resolution images (VHR) such as SPOT 5 images (pixel size = 2.5m) to minimize interpretation errors. Acquisition of such data in Madagascar is possible, for instance through the SEAS-OI Program (satellite-assisted environmental monitoring) piloted by IRD, Reunion University, and the Reunion Region with funding from the European Union. The project is presented in Annex 3-5. However, the cost of such images (unit cost, number of images to cover the entire country), and required processing capacity might restrict their use.

An approach using high resolution images (10 to 30 m pixel) and a limited number of VHR images might be considered. The GEO intergovernmental mechanism only recommends the use of very high resolution images for its pilot projects (GEO-FCT) on well defined control areas throughout the territory. These regions, with a surface of 40x40 km will be assessed with high precision. Results and values obtained from these control areas will help fine-tune estimations for the rest of the territory, for which high-resolution images (LANDSAT type) will be used. GEO also facilitate users' access to spatial data

While the IPCC only proposes one class for forests (forest lands), the various types of forest formations existing in Madagascar and their respective status (i.e. primary, dense, secondary, degraded, etc.) should be considered at national level. There will be a special focus on different forest formation types, as carbon stock varies based on land use and forest formation type and state. This stratification stage will be done using high resolution spatial images (LANDSAT).

Images can be processed based on a method suggested by the Carnegie Institution for Science (Stanford University). This sub-pixel level analysis provides information on the proportion of forest cover, bare soil, etc, allowing for the detection of degradation in addition to deforestation. A free software, CLASlite, based on this method, has been developed by this American research institution and used by PHCF (one of the REDD pilot projects), notably for the assessment of historical deforestation, with good results[33])

The result of this stratification stage will be a national map showing the various homogenous land use units, based on "types" and "state" criteria of forest formations.

Results should be validated by field visits to evaluate classification errors and uncertainties. These control operations will be carried out on representative areas, selected based on their potential for deforestation and/or degradation.

(iii) Estimation of carbon stock in the aboveground biomass by the Lidar (Light Detection and Ranging) technology

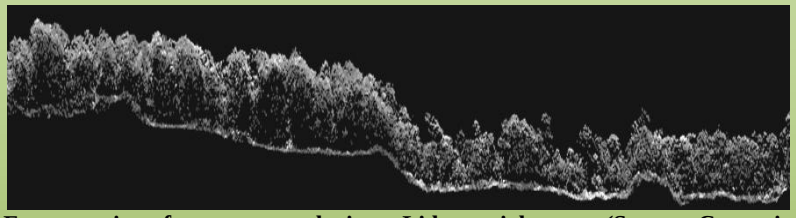
After the stratification results have been validated, the various land use types must be sampled to estimate carbon rate. The PHCF pilot project in Madagascar used an airborne Lidar, with satisfactory results:

[32] Grinand et al, 2009. Etudes des stocks de carbone dans les sols de Madagascar. *Étude et Gestion des Sols, Vol. 16,1, 2009 – p23-33*

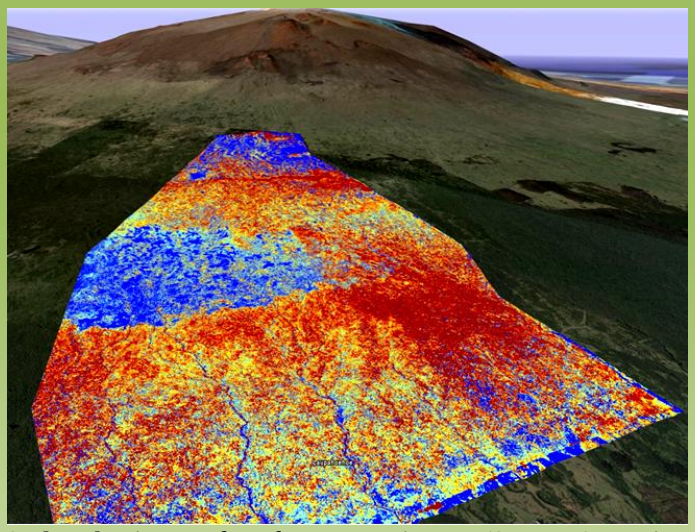
[33] Nature Vol 461, p. 1049-1052 ; Oct. 2009

- ✓ Availability and accuracy of measures of tree height (50 cm uncertainty for 30m trees);
- ✓ Significant reduction of the number of plots for field survey, and hence of the inventory costs for a higher level of accuracy (10 times less plots). Based on the experience of the PHCF, the cost is largely below 1US$/ha.
- ✓ A single measure by formation type is enough to get a reliable estimation of carbon stocks. Use of Lidar requires a 5% sampling rate for an accuracy of 80%. This corresponds to an aerial survey of 450,000 to 600,000 ha of forests (based on the adopted definition of forest).
- ✓ Time-saving: an aerial survey of up to 10,000 ha of forests per day is possible.

Box 4: Results of a Lidar aerial survey.



Forest section after a passage during a Lidar aerial survey (Source: Carnegie Institution)



Carbon density map for a forest range in Peru (Source: Carnegie Institution)

The result of the Lidar mission is a 3D structure of the surveyed area. Subsequently, this 3D structure is translated into carbon density after adjustment using specific allometric allocations for the country's forest formations (See Box 4).

(iv) Development of allometric equations and field surveys

The results of Lidar should be cross-checked with field data collection, i.e. biomass surveys to develop allometric equations for each forest type.

Three existing REDD pilot projects (Makira, CAZ, COFAV) apply the Brown and Chave allometric equations for tropical forests, developed for Amazonia and/or the Congo Basin tropical forests. Two other pilot projects (FORECA and PHCF), in partnership with local research institutions (CIRAD and ESSA-Forêts), decided to initiate studies to develop specific allometric equations for the various Malagasy forest formations. One of the projects (PHCF) selected the partially destructive method and the second (FORECA) the non-destructive approach[34]. Currently, allometric equations derived from the partially destructive method seem to be much more reliable and conservative than the Brown and Chave method, to estimate carbon stocks in aboveground biomass in the Malagasy forest formations. Results are in press.

An assessment of both approaches will be performed during the REDD+ strategy preparation phase. A handbook describing the protocol will be developed and serve as a reference to develop allometric equations including all ecosystems in the country. After development, allometric equations

[34] The method involves felling several trees, weigh them in the field, take some samples to determine density in a lab, etc. The non destructive method does not require tree felling.

for each forest formation type will be used to adjust results from the Lidar generic allometric equations.

The final result with be the map of carbon density of all forest formations in Madagascar, similar to the content of Box 4.

Step 3: Modeling the future evolution of carbon stocks

The previous two steps represent an important part of the development process of the national reference scenario, in place of a scenario proposed at international level. Based on progress made in Copenhagen at the end of 2009 (it is likely that there will be no substantial change in Cancun in November 2010), Madagascar will develop its national reference scenario based on historical deforestation trends. Results of this chronological analysis will be projected in the future after adjustment. As Madagascar is still developing, the development adjustment factor will depend on the country's development stage as well as on the values of these factors defined by international negotiations.

At national level, the political authorities are in charge of determining the national reference level (NR) for carbon accounting. The present document does not cover this point but only the reference scenario under Component 3.

(i) Determination of relevant variables

Many efforts against deforestation have taken place in Madagascar over the past decades. As described under Component 2a, factors of deforestation are well known, including rampant population growth (2.8% per year), unsustainable agricultural practices, poverty and precarious livelihoods of households, and the lack of alternatives and incentives for a sustainable use of resources. Four out of five pilot projects (CAZ, Makira, FORECA, and COFAV) have defined applicable variables to explain and predict deforestation in their respective project areas. They include demographic (population density), socioeconomic (use of forest products), and physical (slope, altitude, distance to rivers, distance to roads, distance to villages, etc.).

For the national reference scenario and the historical context of Madagascar, it is essential to add policy and governance variables, two areas strongly impacting success or failure in achieving the objectives of avoided deforestation/degradation. Thorough studies and assessments will be performed to define the most relevant variables to predict deforestation/degradation. As drivers of deforestation/degradation are not homogenous over the country, it should be confirmed whether modeling of future deforestation/degradation should not take place at ecoregional, rather than national, level. A multidisciplinary team will be recruited to identify relevant variables and to develop projection model(s).

All measurement protocols will be accurately described to assess uncertainties. Knowledge of uncertainty values is recommended by the IPCC for any REDD+ project (IPCC, 2006).

(ii) Spatial modeling

Three existing pilot projects (CAZ, Makira, and COFAV) use a tool to quantify and spatialize future deforestation. The Module Land Use Change Modeler (part of IDRISI software) produces a spatial model of deforestation/degradation, if relevant variables are known. The three mentioned project used neural network as principal engines for the modeling. However, other approaches based on Markov chains, multi-criteria analysis, or others should be explored.

Capacity-building on modeling tools should be implemented during the REDD+ strategy preparation phase.

(iii) Integration of leakages

Since Madagascar is an island, leakages at national level will not be counted as they are internal; however, leakages at regional levels will always be included. An aggregate of several models at regional levels will be compared to a national model. Decision will be made on the need for more detailed analysis to evaluate and include leakage in these regional models. National consultants will be hired to identify potential leakage areas.

C. Capacity-building needs to develop the national reference scenario

The main capacity-building efforts for the development of the reference scenario are described below. Efforts include training of young executives, refresher courses for professionals, and national capacity-building on calculation for forest commissions (at regional level), other ministries involved in designing the reference scenario, and research institutions.

The use of spatial images is a key element of the REDD+ process. Capacity-building will also focus on the numerical processing of remote sensing images, particularly VHR images.

Capacity-building on the interpretation and analysis of the results of a Lidar aerial survey is also needed for technicians and executives from ministries, NGOs, and other institutions.

Capacity-building is required at various levels to be able to develop allometric equations. This will include agents from the technical task force as well as regional structures involved in REDD+.

To ensure the sustainability of the REDD+ process, it is important to develop national scientific knowledge on REDD+: processing of spatial imagery, spatial modeling, rural economy, etc.

A few Malagasy research centers and university laboratories have carried out some research work on a REDD+ related area or another[35]. Consultation with research/training institutions highlighted their willingness to become stakeholders of the REDD+ readiness. Some themes to be developed include: spatiotemporal modeling methods other than the method using Land Use Change Modeler (LCM); VHR imagery processing, use of radar imagery to map often cloudy regions or to clear uncertainties on some optical images; socioeconomic implications of carbon accounting, etc.

D. Budget

Table 23. Summary of Reference Scenario Activities and Budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Establishment and implementation of a technical task force for the national reference scenario	Creation of a technical task force on the national reference scenario	8.47			8.47
	Implementation of the technical task force	16.41	21.87	21.87	60.15
Analysis of the historical deforestation	Definition of forest and the range of the REDD mechanism	8.47			8.47
	Capacity-building in remote sensing including CLASlite, capitalization on and assessment of results of the Environment Modeling in Madagascar	149.90			149.90
	Capacity-building of forest commissions	118.80			118.80
	Capacity-building of other involved ministries	8.47			8.47
	Capacity-building of other involved research institutions	8.47			8.47
	Acquisition of satellite images	10.80			10.80
	Analysis of historical deforestation using CLASlite	90.00			90.00
	Mapping and quantification of past deforestation	10.00			10.00
Determination of current carbon stocks	Selection of pools and studies on litter, dead wood, soil, belowground biomass	5.40			5.40
	Comparative study of aboveground/belowground biomass	33.34	66.66		100
	Acquisition of current satellite images	2.64			2.64

[35] IOGA, ESSA-forêt, LRI/IRD, MEM-IRD project, C3EDM, CNRE, …

	Stratification of the various types of land use	**60.00**			**60.00**
	Field verification	**148.00**			**148.00**
	Cluster sampling	**30.00**			**30.00**
	Lidar aerial survey	**252.00**			**252.00**
	Capacity-building in interpretation and analysis of results from the aerial survey	**120.00**			**120.00**
	Comparative study of two methods of development of allometric equations to develop a standardized manual for the country		**6.00**		**6.00**
	Capacity-building in collection of carbon data		**17.10**		**17.10**
	Field visits to collect carbon measurement data		**170.00**		**170.00**
	Development of allometric equations		**41.00**		**41.00**
	Cross-checking of Lidar results and allometric equations results		**3.00**		**3.00**
	Carbon density mapping		**3.00**		**3.00**
Modeling of future evolution of carbon stocks	Identification of best explanatory variables of deforestation and degradation (+ multidisciplinary consultant team)			**24.00**	**24.00**
	Purchase of IDRISI software and capacity-building on Land Change Modeler (LCM)			**129.20**	**129.20**
	Modeling of future evolution of carbon stocks with LCM			**6.00**	**6.00**
	Identification of likely leakage areas			**24.00**	**24.00**
	Integration of leakage				
	TOTAL 3 SR	**1081.17**	**328.63**	**205.07**	**1614.87**

COMPONENT 4: DESIGN A MONITORING SYSTEM

This component on the MRV system focuses on the system to be implemented in Madagascar to define potential carbon credits from the implementation of the REDD+ strategy. It includes three main aspects: carbon (emissions/removals), drivers of deforestation/degradation, and benefits other than carbon and governance. The system will include data reporting and validation of results and will be declined at three levels: national, regional, and local.

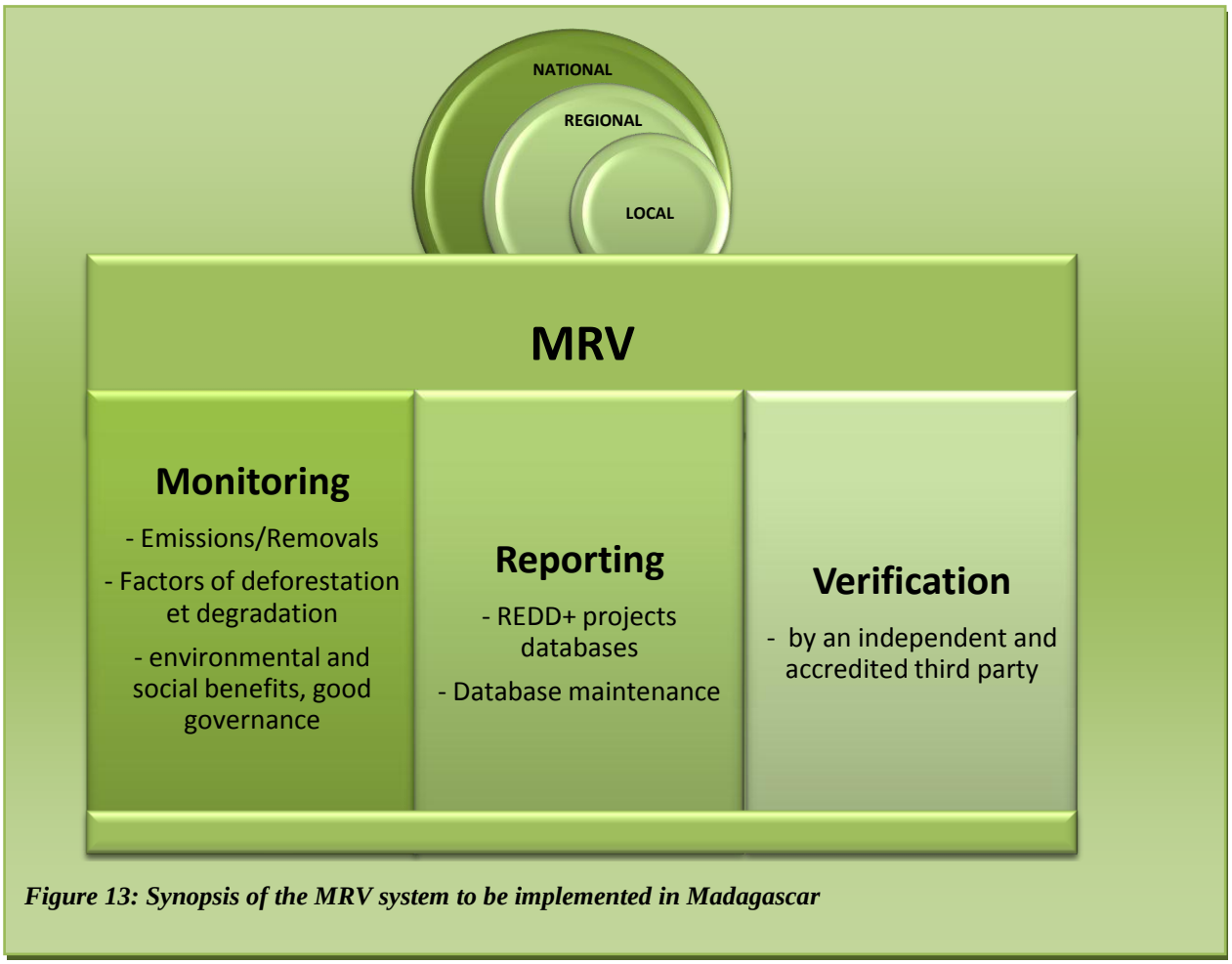


Figure 13: Synopsis of the MRV system to be implemented in Madagascar

The national MRV system will be established within the National Environment Office (ONE).

During the monitoring and verification phases, intervention of independent and accredited third parties as recommended by international standards including CCBS[36] or VCS[37] will be taken into account.

[36] Climate, Community and Biodiversity Alliance: CCB standards. Rule for the use of climate, community and biodiversity standards, 2010

[37] Voluntary Carbon Standard, 2010

4a: Monitoring emissions and removals

The objective of monitoring emissions/removals is the ability to regularly quantify both parameters and compare them to the reference scenario curve over time, in order to estimate potential carbon credits from the country's actions against deforestation and forest degradation.

The principle is to involve all actors in a participatory way, from the local to the national level: data are collected at the local (project or local community level) and regional level to feed the national level database. Subsequently, information will be shared, in a transparent way, to all actors.

A. National-level monitoring system

To the extent possible, structures/entities involved in the "reference scenario" phase, i.e. the technical task force under the BER, will be kept to design the MRV system (See Component 3, paragraph A). However, during the REDD+ strategy preparation phase, a full-time Coordinator of the design phase will be hired and will remain in this position throughout the preparation phase. Attribution of the coordinator includes quality control and quality assessment and design of attribution and responsibilities for the MRV body (See Annex 4a-1). He will work in line with ONE who is the first responsible of MRV.

Madagascar already has operational tools to be applied to REDD+ monitoring. These tools will be refined to include key elements of REDD+, such as carbon or deforestation/degradation factors. At national level, a map of the various forest formations, as well as a map of carbon density at different times will be some of the outputs of this monitoring system.

Monitoring emission factors and activity data

As mentioned above, monitoring carbon stocks trends over time is the one and only way to measure carbon credits (at national level) from avoided deforestation/forest degradation. Carbon stock changes are estimated in the following way:

Once the map of current forest carbon density at national level is established (step 2 of the reference scenario development), Madagascar will have a strong knowledge on forest carbon stocks with Tier 3 accuracy. This map will be the reference point to monitor carbon stock trends. In accordance with methodology elements proposed for developing the reference scenario, Madagascar will choose high resolution satellite images such as LANDSAT (30m) to monitor forest cover trends, and very high resolution images for control areas. Representative plots of all land use types, including various forest states (natural and artificial) will be regularly monitored. The location, size, and nature (permanent or random at each monitoring period) of plots (control areas) will be determined by the technical task force during the preparation phase.

By overlapping future maps with the reference map (the carbon density map at national level), the quantity of carbon lost between both dates will be calculated. This approach will also include a potential increase of carbon stock: natural growth rates of the various types of forests will be applied to compute the potential increase of carbon stocks.

Currently, monitoring of the various formations uses LANDSAT imagery acquired every five years (1990, 1995, 2000, 2005). The reference scenario will use the same images (See Component 3). However, monitoring will be more refined (2 or 3 years) to allow for potential revision of the national strategy based on the evolution of the situation. Benefits and constraints of all options will be assessed against logistical and human requirements.

Regular feedback mechanisms will be established to assess the success of intervention directions. A surveillance system will regularly analyze deforestation and degradation trends, determine changes of related socioeconomic causes, and identify potential issues related to forest governance. This mechanism will help adjust planned interventions and reevaluate REDD+ strategies as needed.

Handbooks and technical guidance will be designed, published, and distributed to actors at all levels to standardize measurement protocols, ensure transparency of data, and guarantee the quality of collected data.

B. Regional-level monitoring system

Monitoring emission factors and activity data

In addition to the monitoring of carbon stock trends by remote-sensing, as at the national level, field verification through surveys and data collection on clearing, fires, etc. will be performed. The principle here is to use decentralized structures at regional level to forward data collected in the field, and then cross-check them with processed satellite imagery at national level. Once the analyses and error estimations done, results will be communicated to all so that involved actors are regularly aware of the monitoring results.

While leakage is not taken into account at national level, it should be included and quantified at regional and local (project) level as internal leakage (at sub-national level) is virtually unavoidable. Studies will be carried out to develop a methodology to spatialize leakage areas at regional and local (project) level and quantify related emissions; one option is to use the BiocarbonFund methodology (under the VCS standard). Once the methodology has been finalized and tested, it will be used as a tool to assess leakage of future REDD+ projects.

Monitoring various factors of deforestation/degradation

Fires are an important factor of deforestation /degradation. The national monitoring structure will be in charge of national monitoring of bushfires with the use of satellite data.

The main drivers of deforestation/ forest degradation are not homogenous. Therefore, a monitoring system at regional level will be more appropriate for more effective efforts targeting specific regional factors. Monitoring structures and tools already exist, including the Food Security and Rural Information Systems (SIRSA), the Rural Observatories Network (ROR), the Gender Observatory SIMIRALENTA, the Regional Land Planning Schemes (SRAT), the Social Dashboard (TBS), and the Environmental Dashboard (TBE) (See Annex 4a-2). Such structures and tools represent a relevant source of data to better address deforestation and forest degradation, compared to other strategies relying on agglomerated data that do not necessarily reflect the actual factors. Regular update (including addition of new indicators relevant for REDD+) of knowledge on the impacts of these factors will help readjust actions against deforestation/forest degradation.

The national database will be fed by aggregation of data collected at regional levels.

C. Local-level monitoring system

The local level includes REDD+ projects and local communities.

Monitoring emission factors and activity data

As previously mentioned, effective participation of local communities is one of the foundations of the MRV system for REDD+ in Madagascar. Therefore, they will be fully involved in the implementation of MRV systems. However, involving communities to perform monitoring tasks on carbon stock trends in the forests they manage will not be possible overnight.

The approach will be gradual. First, lessons learned from the existing monitoring systems will be reinforced (participatory ecological monitoring including periodic dendrometric measures, under activities such as transfers of natural resources management for pilot projects e.g. Makira, contractual forest management, etc.).

Then, and in parallel with various awareness campaigns and gradual capacity-building of local communities, simple tools will be developed to help local people collect more complete and reliable data to monitor carbon stock trends.

REDD+ projects will measure carbon rate, perform ecological surveys, and assess leakage.

Monitoring various factors of deforestation/degradation

Similarly to the monitoring of carbon stocks, full involvement of local communities is essential to monitor the various factors of deforestation/degradation identified in Component 2. Local communities will be also involved in fire monitoring and actions against bushfires. Recording the frequency and extent of bushfires at local level would be a first step for actions to reduce damage from fires.

REDD+ projects will monitor deforestation/degradation factors at local level.

4b: Monitoring of other benefits and impacts

The implementation of REDD+ will produce substantial positive benefits and impacts other than carbon. Such impacts and benefits should be monitored and assessed for higher added value of REDD+. REDD+ will stimulate actions in favor of biodiversity conservation in Madagascar and will induce more realistic duration of support, including on technical, organizational, and financial management aspects at various levels, to sustain practices associating development and biodiversity conservation. Revenues from the REDD+ mechanism will ensure support for a longer period than the usual duration of projects. There will be a special focus on governance monitoring under REDD+: roles of different institutions and actors, their accountability, governance, and transparency have to be taken into account from the inception of the design phase of the monitoring system, and throughout the implementation of the REDD+ strategy.

In Madagascar, the following areas will benefit the most from the positive impacts of REDD+:

Biodiversity conservation:

As previously mentioned, Madagascar is a Megadiversity country with remarkable rates of endemism both for fauna (15 out of the 65 genera of primates in the world are endemic to Madagascar including all lemurs, etc.) and for flora (90% out of 12,000 plant species) (MEF, Rapport national CDB 2009). The biodiversity of Madagascar is a true world heritage. This exceptional biodiversity is mainly terrestrial and found in forest habitats. Any action preventing forest loss will automatically prevent biodiversity loss.

However, biodiversity richness is not uniformly distributed among all forests. During the preparation phase of the REDD+ strategy, high biodiversity areas should be identified, and basic data on the state of biodiversity and threats on these areas, etc. should be gathered before implementing the REDD+ strategy. This aims at establishing a baseline for biodiversity to compare future similar data when the REDD+ strategy is implemented.

Sustainability of environmental goods and services provided by forests:

As long as humans have been present on the island, forests have always provided goods and services on which the livelihoods of populations living near forests (or even of communities living far from forests) depend. Water resources are an example as deforestation end up drying up springs feeding river networks at the level of a watershed. Therefore, preventing deforestation/degradation through the implementation of the REDD+ strategy will contribute to the upstream preservation of water resources with downstream impacts (irrigated rice cultivation, agricultural fields, etc.).

Enhancement of well-being/livelihoods of populations living near forests.

For several generations, wood and non-timber forest products (silk, honey, medicinal plants, etc.) have represented a source of social, economic, and cultural, and even religious (e.g. Ala faly: taboo forests) activities for the Malagasy people. Some activities help the local populations improve their livelihoods (sale of products, craft, etc.) with light technical support (craft capacity-building, packaging, etc.) and support for market access. Therefore, preventing deforestation/degradation through REDD+ will improve the well-being and/or the livelihoods of populations living near preserved forests, by giving them additional sources of income.

In summary, implementation of REDD + will also ensure social and environmental safeguards, in addition to carbon.

Madagascar will draw on (and analyze) several standards available at international level (CCBS, VCS, etc.) to develop a matrix of indicators including (1) indicators included in existing monitoring systems and applied and/or (2) the full matrix, to complement existing systems for the monitoring of benefits and impacts other than carbon, based on the specificities of the country.

Existing tools that should be consulted, and refined as needed to understand the dimensions of REDD+ are described below.

Existing monitoring tools

Existing references such as the National Land Planning Schemes (SNAT) and the Environmental Dashboard (TBE) will be completed with results/data from the REDD+ implementation and vice versa. The TBEs, presented in Annex 4a-2, are already applied at national and regional levels to monitor environmental (biodiversity, soil and vegetation cover, continental waters, etc.), socioeconomic, climate, and physical parameters, to assess the state and evolution of the environment and the progress of environmental management. Currently, 20 out of the 22 regions have a regional TBE. The last two regional TBEs will be developed during the strategy preparation phase.

The Social Dashboard (TBS) is the other existing monitoring tool. It applies several social indicators such as the human development index and population livelihoods, while involving several sectors (agriculture, population, health, mining, tourism, education, external trade, etc.). Regional TBS exist but need to be refined.

Such tools will be improved and used to monitor other benefits and impacts of REDD+.

At the local level, impacts on the improvement of livelihoods of local populations will be assessed, ideally in a fully independent way (no links with the various stakeholders of the national REDD+).

Governance

A governance monitoring system will also be established, taking into account structures identified to implement the REDD+ strategy (see Component 2c). Four main criteria will be included:

- During the preparation phase, the roles and responsibilities of the various institutions (governmental and nongovernmental) will be identified and separated. Proper definition of the roles of each institution is a prerequisite for the creation of a functional and unequivocal structure, with responsible and accountable actors. The PCP-REDD+ will coordinate preparation efforts.
- The process will involve interactive participation, the only form of participation where everyone (including potentially marginalized minority and vulnerable groups) will influence decision-making to establish a governance monitoring mechanism (See Annex 4b). Involvement of all stakeholders will minimize risks related to weak governance. There will be a special focus on the involvement of the civil society.
- Transparency of information availability and access, as well as of the management of the REDD+ database will be ensured.

- Information by existing national structures working against corruption to integrate REDD+: Integrity Monitoring Committee (CSI), SAMFIN (Control Unit against Money Laundering), and Independent Anti-Corruption Bureau (BIANCO).

Following consultations at various levels (national, regional, local) during the preparation phase (see component 1b), indicator matrix for governance monitoring will be designed in a participatory way.

The figure below summarizes the benefits other than carbon provided by REDD+.

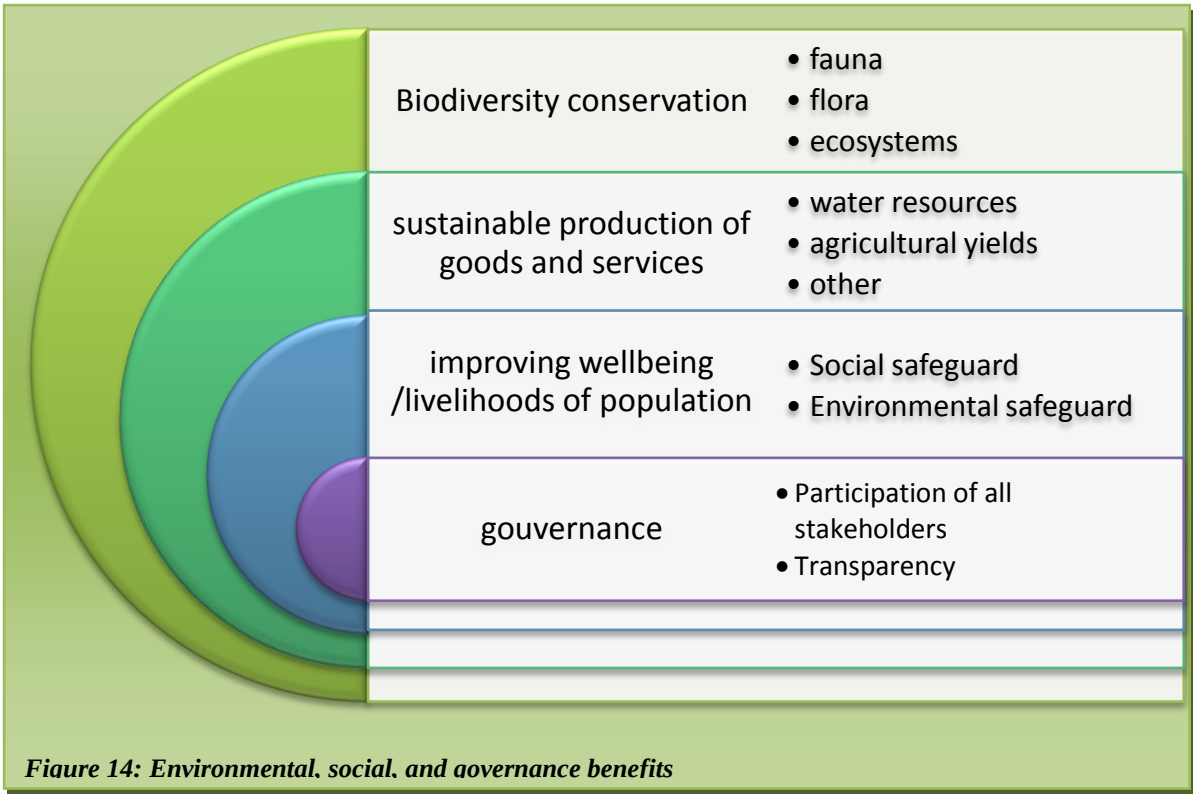


Figure 14: Environmental, social, and governance benefits

4c: Reporting and verification

A reporting system will be implemented in parallel with the design phase of the monitoring system. Madagascar has acceded to the United Nations Framework Convention on Climate Change and must publish a national communication. The REDD+ reporting system at national level will periodically inform this communication. More detailed analyses will be performed to design the reporting system. Some key elements are described below.

A. Databases for REDD+ projects

From the results of the analyses of forest cover trends, TBE and TBS data and data collected using the monitoring matrix for benefits other than carbon (described above) should be compiled and updated. A database and metadata base for REDD+ projects should be created. They will be managed by ONE, in cooperation with the Ministry of the environment and forests, INSTAT, etc. Data and metadata will serve to collect and cross-check information from different sectors and levels, including social (statistics by region, indicators, population growth rate, migrations, etc.), environmental (indicators, statistics, etc.), forest (allometric equations, wood density by tree species, expansion factors, biomass/$C0_2$ ratio, etc.) and thematic (thematic maps not found at the BDSN) data. Information will be shared between the Government and REDD+ project developers. The database will be developed during the first year of the REDD+ strategy preparation phase.

Results from project activities such as the "Knowledge Management" component of the UNDP/GEF support project to PEIII could be used or capitalized during the REDD+ strategy preparation phase.

B. Database maintenance

Database maintenance includes providing hardware and software, coordinating a network of contributors (universities, research labs, forest specialists, etc.), as well as making information available to ongoing REDD+ projects, project developers, and any other interested entity or structure. Information dissemination could be done through a numeric document accessible from a portal (e.g. ONE) or a DVD. Once again, selection of the institution in charge of database maintenance will be participatory. Data management requires transparency.

Any data collected under REDD+ projects will include a note on measurement protocols, assumptions, dates of data acquisition, observers, and accuracy of data. Such information is required to ensure transparency of data and comparability of our results with other countries'. Free access to this information is another guarantee of transparency.

Knowledge of the uncertainty level of each category of measurement (in the IPCC-2006 recommendations) is another prerequisite for the validity of the REDD+ process.

C. Verification

The possibility of external verification of data (still the subject of international negotiations) and results is a key element of the REDD+ mechanism. The verification system will comply with the CCBA recommendations (2010). Highlights of this standard include publishing and disseminating verification documents, hiring a qualified auditor (national and/or international) public consultations, field visits, and publication of the final verification report.

As there is currently no national auditor who can perform this verification, Madagascar will have to call on international auditors; capacity-building of national auditors will take place simultaneously.

4d: Capacity-building

Use of satellite imagery for the MRV is a special element of the REDD+ process. It involves relatively new techniques for most REDD+ actors in Madagascar. National and regional (ministry in charge of forests, ONE, regions, and other sectors) capacity-building is required on processing optical and radar images and using spatiotemporal models.

Similarly, the use of other technologies such as CLASlite requires training national and regional actors, including agents from the ministry in charge of forests, ONE, and the regions.

ONE will also benefit from capacity-building in information management system. At the same time, during the readiness phase, institutions to be involved in implementing the REDD+ monitoring system will be identified and their capacities will be subsequently reinforced.

Regional institutions participating in ecological data collection, evaluation of carbon rates, and data reporting will receive capacity-building on ecological inventory, carbon stock evaluation, leakage assessment, and database management/maintenance.

Measurement protocols (reference scenario, MRV) will be designed and disseminated through handbooks/guidance. They aim at standardizing approaches and estimations of the level of precision. Training sessions on the use of these handbooks will be organized at national and regional level.

At the level of regions and local communities, training and information sessions on climate change and REDD+ will be organized. REDD+ national structures and regional structures collecting MRV data will be equipped with computer and image processing and GIS software.

Mixed research groups (national/or international) will be mandated to assess the use of radar images and other alternative methods such as Leaf Area Index (LAI) to assess and monitor aboveground biomass. Radar imagery is the only possibility in often clouded areas (the North, mountainous areas), and might reduce uncertainties of optical images for some land uses.

Activités et Budget

Table 24. Summary of MRV activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US$)			
		Year 1	Year 2	Year 3	TOTAL
Monitoring of carbon stocks at national level	Determination of timeframe for the production of monitoring maps	8.47			8.47
	Integration of current monitoring systems in the MRV	13.67			13.67
	Design of control areas	65.00	30.20		95.20
	Implementation of control areas	60.00	20.47		80.47
	Development of guidebooks/ handbooks for application (MRV)			21.47	21.47
	Studies on alternative methods for monitoring and estimation of carbon rates	37.50	37.50		75.00
	Capacity building	29.74	20.00		49.74
Monitoring of carbon stocks at regional level	Image processing	86.40			86.40
	Field data collection (surveys, clearing data, etc.)	13.50	14.50		28.00
	Design of a methodology approach for monitoring, taking into account existing tools /instruments	12.60	5.20		17.80
	Capacity building	35.00	100.00	100.00	235.00
	Analysis for leakage monitoring		14.10		14.10
Monitoring of carbon stocks at local level	Capacity building		40.00	53.10	93.10
Monitoring of governance and REDD+ co-benefits and impacts	Definition of indicators of institutional operations	5.20			5.20
	Definition of indicators of establishment of legal tools	5.20			5.20
	Integration of the REDD+ strategy in sectoral strategy documents			16.27	16.27
	Re-dynamisation and update of existing monitoring systems	47.71			47.71
	Definition of financial indicators	5.20			5.20
	Definition of implementation indicators	5.20			5.20
	Information CSI/BIANCO	4.24	4.23		8.47
Reporting and transparency	Design and creation of databases	15.67			15.67
	Database maintenance	48.00	48.00	48.00	144.00
	Capacity building	26.55	30.00	30.00	86.55
	Online publication of databases	24.00	24.00	24.00	72.00
Verification	National capacity building in verification	30.00	30.00	46.20	106.20
	External verification around the beginning of Year 3			12.10	12.10
Recruitment	Recruitment of Coordinator	0.50			0.50
Operation of Technical Monitoring Unit for information management	Salaries	21.60	21.60	21.60	64.80
	Other operational costs	10.80	10.80	10.80	32.40
	TOTAL 4 MRV	611,95	455.60	383.54	1 445.89

COMPONENT 5: SCHEDULE AND BUDGET

A. Total budget

Implementation of the Madagascar R-PP requires US$5.554 million.

Table 25. Total budget for R-PP implementation

Component	Estimated Cost (US $)	Percent of total
1a National Readiness Management Arrangements	779 210	14,0%
1b Stakeholder Consultation and Participation	628 890	11,3%
2a Assessment of Land Use, Forest Policy and Governance	192 420	3,5%
2b REDD+ Strategy Options	387 080	7,0%
2c Implementation Framework	130 390	2,3%
2d Social and Environmental Impacts	210 470	3,8%
3 Reference Scenario	1 614 870	29,1%
4 MRV: Monitoring, Reporting, and Verification	1 445 890	26,0%
6 Monitoring and Evaluation of Readiness Implementation	164 500	3,0%
TOTAL COST of the R-PP	5 553 720	100,0%

B. Detailed schedule of status quo activities

The following tables summarize the activities and budget of each component and specify the implementation schedule, indicating if activities can be implemented under a status quo condition (sub-activities or activities in bold italics).

Component 1a: Readiness Management Arrangements

Table 26. Detailed schedule and budget for national readiness management arrangement

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Management tools and staff	*Recruitment*	*700*	X											
	Development of BER management tools	*30 181*	X	X										
	Initial training	*9 020*	X	X										
Program settlement	*First installation: Material and office establishment*	*23 000*	X											
	Acquisition of vehicles, computers, photocopiers, and communication material	*48 550*	X	X										
Operations	*Office operations: salaries and social expenses*	*221 490*	X	X	X	X	X	X	X	X	X	X	X	X
	Office operations: expenses and services	*68 400*	X	X	X	X	X	X	X	X	X	X	X	X
	Vehicle operations (except missions outside of Tana)	*27 600*	X	X	X	X	X	X	X	X	X	X	X	X
Activities and recurrent costs	*Activities: Management of BER operations*	*25 200*		X	X	X	X	X	X	X				
	Activities: Development of the REDD+ management arrangement	*21 752*						X	X	X	X	X		
	Activities: Communication and relations with sectoral actors	*42 800*	X	X	X	X	X	X	X	X	X	X	X	
	Activities: Operational costs PCP-REDD+ and CIME	*189 710*		X	X	X	X	X	X	X	X	X	X	X
Management costs of program	*Financial and accounting management fees*	*54 000*	X	X	X	X	X	X	X	X	X	X	X	X
	Other costs	*16 800*												
	Total Component 1a	*779 210*												

Component 1b: Public consultation and participation

Table 27. Detailed schedule and budget for stakeholder consultation and participation

Main activities	Sub-activities	Estimated Cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
1- Information and awareness of the general public on REDD+, the R-PP, the development process of the strategy, the key elements of the strategy and dissemination of the strategy	***Initial information sharing (REDD+, R-PP, readiness arrangement, etc.)***	115 004		X	X									
	Regular communication on development: provide feedback on the key ideas for the baseline, strategy options, implementation mechanism, and carbon governance	118 655	X	X	X	X	X	X	X	X	X	X	X	X
	Collection & analysis of opinions on disseminated information	4 500								X				
	Dissemination of strategy	76 661											X	X
2- Consultation to collect elements for each intervention area for prioritization	***Collection of socioeconomic, political, and cultural information on each intervention area and reference information at regional level***	48 228				X								
	Collection of additional information among various institutions to complete and cross-check information and base data	14 383					X							
3- Consultation to assess leakage risks to inform the combination of intervention directions	***Collection of socioeconomic, political, and data and information underlying the displacement of emissions from deforestation in degradation in and around potential REDD+ sites***	41 500								X				
4- Dialogue on the pre-finalized strategy	Collection of views and observations of sectoral decision-makers on the pre-finalized strategy in terms of policies, regulations reforms, institutional arrangement, planned programs, resources, etc.	46 151									X			
5- Consultation on carbon revenue governance	***Capitalization on experiences on forest revenue management to draft a global outline for governance and revenue-sharing***	3 700										X		
	Dialogue and negotiation on management and transparent management of revenues (including accountability)	51 446										X	X	
6- Implementation of the detailed SESA	Collection of opinions and concerns on strategies and their environmental and social impacts	pm	X											
	Validation of the preliminary detailed SESA	pm			X		X			X		X	X	
	Evaluation of the detailed SESA	pm			X				X					X
7- On the reference scenario	***Identification of best explanatory variables of deforestation and degradation***	54 555	X	X	X	X								
	Model validation	1 000						X						
	Presentation and validation of a first version of the model	21 436									X			
	Presentation of the final version of the model	10 071										X		
	Consultation on the monitoring system	21 600			X				X			X		
	Total Component 1b	**628 889**												

Component 2a: Assessment of Land Use, Forest Policy, and Governance

Table 28. Detailed schedule and budget for assessment of land use, forest policy, and governance

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Assess and classify actors in the timber sector based on their deforestation and forest degradation capacities	*Identification and prioritization of actors based on the impacts of their activities on deforestation and forest degradation*	3 000	X											
Assess spatial distribution of causes of deforestation and degradation	*Definition and identification of the most representative areas for deforestation*	3 000	X											
	Review and analysis of existing knowledge on the causes of deforestation and degradation	3 120	X											
	Sampling and surveys at regional and local levels	45 114	X											
	Data processing and analysis, extrapolation at national level	3 000		X										
Analyze the political economy of deforestation and forest degradation	*Typology of entities relevant for deforestation and forest degradation*	1 600	X											
	Review and literature analysis on the main challenges of deforestation and forest degradation	3 400	X											
	Field surveys and research	45 114	X											
	Data analysis, summary of results, and proposed recommendations	10 471		X										
Assess efforts and international experiences on the intervention directions	*Review and literature analysis, capitalize on the outcomes of national experiences*	2 000	X											
	Additional data collection and institutional consultation at different levels	19 800	X											
	Research on international experiences	2 000	X											
	Assessment and selection of intervention directions	27 671		X										
Assess the economic contribution of the forest sector	*Review of various existing economic studies and collection of base data for calculation*	3 000		X										
	Collection of additional information	5 255		X										
	Development of assumptions, data processing, analysis and interpretation of results	4 400		X										
	Assessment of prospects and production of recommendations	10 471		X										
	Total Component 2a	**192 417**												

Component 2b: REDD+ strategy options

Table 29. Detailed schedule and budget for activities related to strategy options

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Development of the list of intervention directions	***Development of the list of the most promising intervention directions based on deforestation causes***	***19 800***		***X***										
Detailed analysis of intervention directions	***Evaluation of benefits and impacts of intervention directions***	***23 880***			***X***		***X***							
	Feasibility assessment of the implementation of intervention directions	***35 930***			***X***	***X***	***X***							
	Assessment of economic benefits and costs of intervention directions	***32 080***			***X***	***X***	***X***	***X***						
	Summary and compilation of assessments on intervention directions	***39 990***						***X***						
Analysis of combinations (scenarios) of intervention directions	***Development of strategy scenarios***	***25 770***						***X***						
	Costs and benefits analysis of scenarios	***19 800***						***X***						
	Specific studies: collection of additional information, integration SEA, sustainability, monitoring system	***39 990***						***X***	***X***					
Development of the REDD+ strategy	Development of REDD+ strategies. Development of spatialized strategies. Consultation. Integration of SESA aspects (mitigation, safeguard, etc). Negotiation at the level of decision-makers	***60 060***							X	X	X			
	Assessment of national capacities, resources needs, proposal on capacity-building	***44 040***								X	X			
Study for strategy implementation	***Development Plan of implementation tools for strategies and reforms***	***25 900***								X				
	Preliminary studies on additional fund raising to finance the REDD system	***20 000***									X			
	Total Component 2b	**387 240**												

Component 2c: REDD+ implementation framework

Table 30. Detailed schedule and budget for the implementation framework

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Studies on required institutional and legal reforms	***Assessment of global regulatory framework for REDD+ strategies implementation. Regulatory assessment. Proposition of needed reforms. Design of institutional arrangement. Tor 2c.1***	***21 951***							***X***	***X***				
	Studies and prospects for the sustainability of the implementation framework (Tor2c.1)	***12 538***								***X***	***X***			

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
	Design of adequate tools at community level for implementation (Tor2c.2)	***15 699***									***X***	***X***		
	Proposition of monitoring system on strategies and variations of the causes of deforestation (ToR 2c.3)	***2 400***				***X***								
	Support to and negotiation with decision-makers to formalize regulations on the new management arrangement	***2 000***										***X***		
Studies on carbon governance	Preparation of actors on carbon governance principles: awareness on governance principles, publication of communication tools (ToR 2c.4)	2 000	X											
	Feedback on carbon governance, associated with consultations during the detailed assessment of the causes of deforestation. Consolidation. Preliminary discussions with key actors.(ToR 2c.4)	6 458		X										
	Analysis of carbon ownership. Proposal. Regulatory assessment for carbon governance (ToR 2c.4)	7 236			X									
	Studies to develop the carbon revenue sharing mechanism, associated with the sustainability effort for the entire mechanism (monitoring, MRV, etc. ToR 2c.5)	34 889				X	X	X						
	Development of a transparent management arrangement and carbon revenue monitoring. Institutional proposal. Regulatory proposal.(ToR 2c.6)	25 219					X	X						
	Total Component 2c	**130 388**												

Component 2d: Social and environmental impacts

Table 31. Detailed schedule and budget for the SESA

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Development of SESA tools for REDD+	***Development of SESA guidance for REDD+***	***13 721***	***X***											
Capacity-building	***Training of various stakeholders at central level***	***32 543***		***X***										
	Training of various stakeholders at regional level	***24 950***		***X***										
SEA framing	***Development of ToRs***			***X***										
	Preliminary survey	***10 471***			***X***									
	Adjustment of ToRs				***X***									
	Guidelines				***X***									
SEA implementation	***Assessment of environmental and social impacts based on the REDD+ strategy***	***53 188***				***X***	***X***							
	Development of the detailed SESA and validation	***12 236***						***X***						
	Finalization of the SESA	8 000						X						
Evaluation of the SESA file	***Technical evaluation by ONE/CTE***	5 000							X					

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
	Public evaluation	29 671							X					
	Institutional evaluation	10 971							X					
	Instructions and recommendations	1 250								X				
	Communication of results	8 471								X				
	Total Component 2d	**210 473**												

Component 3: Development of reference scenario

Table 32. Detailed schedule and budget for the development of the reference scenario

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Establishment and implementation of a technical task force for the national reference scenario	***Creation of a technical task force on the national reference scenario***	***8 471***	***X***											
	Implementation of the technical task force	***60 143***		***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***
Analysis of the historical deforestation	Definition of forest and the range of the REDD mechanism	8 471		X										
	Capacity-building in remote sensing including CLASlite, capitalization on and assessment of results of the Environment Modeling in Madagascar	149 900		X										
	Capacity-building of forest commissions	118 800		X										
	Capacity-building of other involved ministries	8 471		X										
	Capacity-building of other involved research institutions	8 471		X										
	Acquisition of satellite images	10 800			X									
	Analysis of historical deforestation using CLASlite	90 000			X	X								
	Mapping and quantification of past deforestation	10 000				X								
Determination of current carbon stocks	***Selection of pools and studies on litter, dead wood, soil, belowground biomass***	***5 400***		***X***										
	Comparative study of aboveground/belowground biomass	***100 000***		***X***	***X***	***X***	***X***	***X***	***X***	***X***				
	Acquisition of current satellite images	***2 640***			***X***									
	Stratification of the various types of land use	***60 000***			***X***									
	Field verification	***148 000***				***X***								
	Cluster sampling	***30 000***				***X***								
	Lidar aerial survey	***252 000***				***X***								
	Capacity-building in interpretation and analysis of results from the aerial survey	***120 000***				***X***								
	Comparative study of two methods of development of allometric equations to develop a standardized manual for the country	***6 000***					***X***							

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
	Capacity-building in collection of carbon data	***17 100***						***X***						
	Field visits to collect carbon measurement data	***170 000***						***X***	***X***	***X***				
	Development of allometric equations	***41 000***							***X***					
	Cross-checking of Lidar results and allometric equations results	***3 000***								***X***				
	Carbon density mapping	***3 000***								***X***				
Modeling of future evolution of carbon stocks	Identification of best explanatory variables of deforestation and degradation (+ multidisciplinary consultant team)	24 000									X			
	Purchase of IDRISI software and capacity-building on Land Use Change Modeler (LCM)	129 200										X		
	Modeling of future evolution of carbon stocks with LCM	6 000											X	
	Identification of likely leakage areas	24 000											X	
	Integration of leakage													
	Total Component 3	**1 614 867**												

Component 4: Monitoring system design

Table 33. Detailed schedule and budget for the design of the monitoring system

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
Design of monitoring of carbon stocks at national level	***Determination of timeframe for the production of monitoring maps***	***8 471***	***X***	***X***										
	Integration of current monitoring systems in the MRV	***13 671***		***X***	***X***									
	Design of control areas	***95 200***		***X***	***X***	***X***	***X***	***X***						
	Implementation of control areas	***80 471***			***X***	***X***	***X***	***X***	***X***	***X***				
	Development of guidebooks/ handbooks for application (MRV)	***21 471***									***X***	***X***		
	Studies on alternative methods for monitoring and estimation of carbon rates	75 000	X	X	X	X	X	X	X	X				
	Capacity building	49 743	X	X	X	X	X	X	X	X				
Monitoring of carbon stocks at regional level	***Image processing***	***86 400***	***X***	***X***	***X***	***X***								
	Field data collection (surveys, clearing data, etc.)	***28 000***		***X***	***X***	***X***	***X***	***X***						
	Design of a methodology approach for monitoring, taking into account existing tools /instruments	***17 800***		***X***	***X***	***X***	***X***							
	Capacity building	***235 000***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***
	Analysis for leakage monitoring	***14 100***					***X***	***X***						
Monitoring of carbon stocks at local level	***Capacity building***	***93 100***					***X***	***X***	***X***	***X***	***X***	***X***	***X***	***X***
Monitoring of governance, other benefits and impacts														
	Definition of indicators of institutional operations	***5 200***		***X***	***X***									
	Definition of indicators of establishment of legal tools	***5 200***			***X***	***X***								
	Integration of the REDD+ strategy in sectoral strategy documents	***16 271***											***X***	***X***

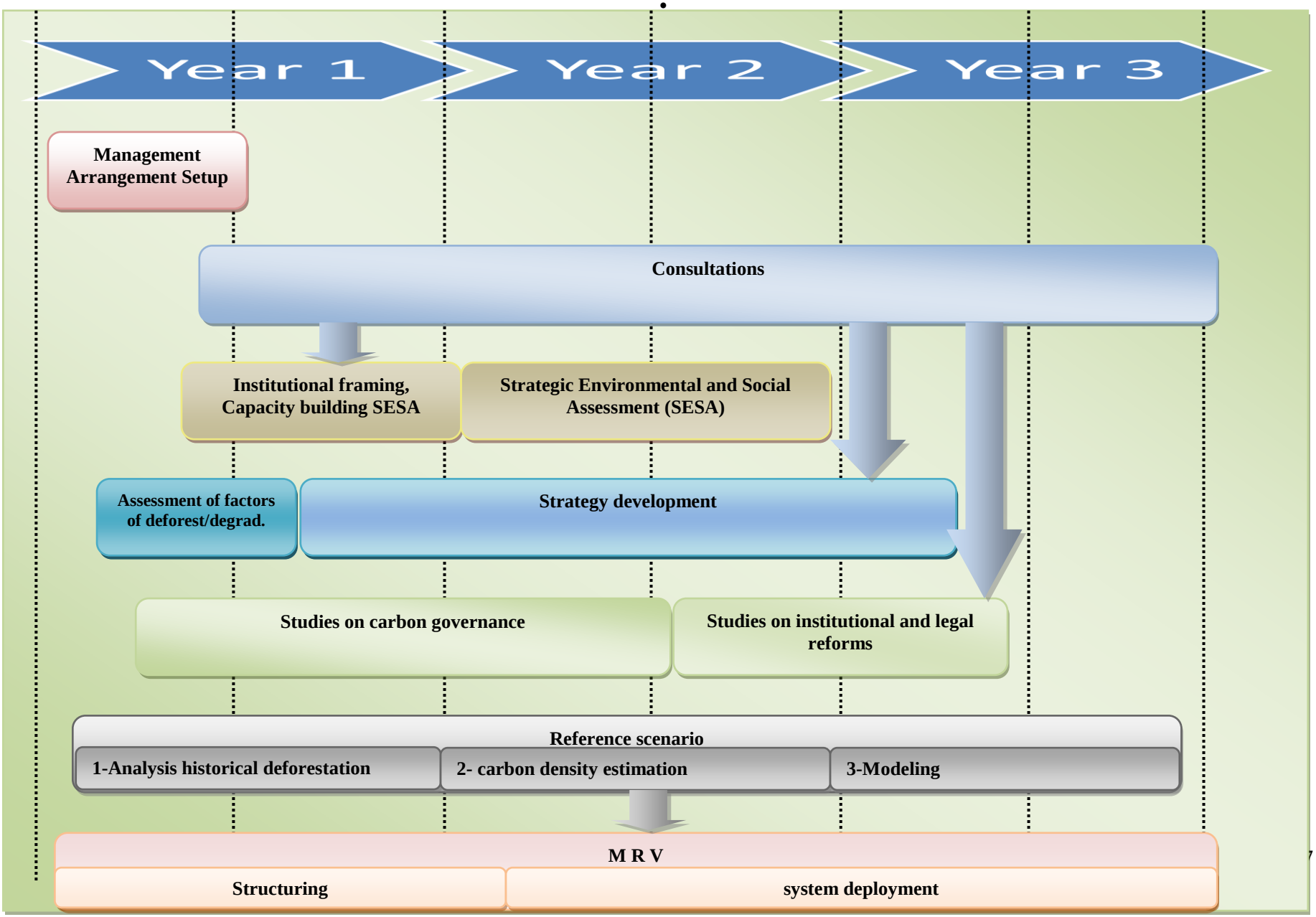
Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
	Redynamisation et actualisation des systèmes de suivi existants	*47 710*	*X*	*X*	*X*	*X*								
	Definition of financial indicators	*5 200*						*X*						
	Definition of implementation indicators	*5 200*						*X*	*X*					
	Information CSI/BIANCO	8 471				X	X							
Reporting and transparency	*Design and creation of databases*	*15 671*						*X*	*X*					
	Database maintenance	*144 000*		*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	Capacity building	*86 543*									*X*	*X*	*X*	*X*
	Online publication of databases	*72 000*			*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
Verification	*National capacity building in verification*	*106 200*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	External verification around the beginning of Year 3	*12 100*									*X*	*X*		
Operation of Technical Monitoring Unit for information management	*Recruitment of the coordinator*	*500*	*X*											
	Salaries	*64 800*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	Other operational costs	*32 400*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*	*X*
	Total Component 4	**1 445 890**												

Component 6: Design of a monitoring and evaluation framework

Table 34. Detailed schedule and budget for monitoring and evaluation

Main activities	Sub-activities	Estimated cost ($US)	Year1				Year2				Year3			
			1	2	3	4	1	2	3	4	1	2	3	4
MES Implementation	*MES design*	12 471	X											
	MES validation	6 200	X											
	Deployment for MES operations	3 444		X										
Monitoring	*Collection of indicators*	25 044		X	X	X	X	X	X	X	X	X		
	Processing and analysis	18 000			X	X	X	X	X	X	X	X	X	
	Results	18 000			X	X	X	X	X	X	X	X	X	
Evaluation	*Mid-term evaluation*	40 671								X				
	Final evaluation	40 671												X
	Total Component 6	**164 502**												

- ***Synopsis of the REDD+ strategy preparation in Madagascar***



COMPONENT 6: DEVELOPMENT OF A MONITORING AND EVALUATION FRAMEWORK

Objective

The main objective of the monitoring and evaluation framework during the readiness phase is to establish decision and guidance tools, derived from objective assessment of progress during implementation of activities planned under the R-PP components and their results.

Expected outputs of the R-PP monitoring and evaluation system

The system will regularly produce the following elements:

- Semi-annual statement on the physical implementation of components. Monitoring reports of activities and recommendations for each component.
- Annual statement on the physical implementation of components for a given year, to inform the development of proposals for the following year. The statement will include:
    - The level of implementation of the R-PP in general and of each component in particular, and
    - The level of stakeholders' participation.
- Needed adjustments to guide planning in order to achieve set objectives.

Criteria

The monitoring and evaluation system for R-PP implementation should respect several criteria. The first criteria aim at ensuring effectiveness of the system:

- The system should provide timely information to the various components,
- The system should not alter the operations of the R-PP implementing structures, and
- While the system should be functional, it should be simple enough to ensure smooth operations.

The following criteria aim at ensuring relevance of the system:

- The system should be able assess data based on the various components and sub-components,
- The system should be able to assess data based on defined spatial framework. This criterion requires that the spatial dimension is taken into account.

Monitoring and evaluation for implementation

The logical framework is the main support of the R-PP implementation monitoring and evaluation system. It specifies expected results at the various levels of objectives, in the form of objectively verifiable indicators. It is the reference document to monitor and evaluate the level of implementation of the R-PP. The monitoring and evaluation system for R-P implementation will be based on his document and will focus particularly on indicators related to (i) the process and (ii) the results.

- The process indicators will measure the results of the R-PP implementation. They will be defined based on the mobilized financial and human resources under the R-PP, and on the progress of activities under each component of the R-PP.
- The results indicators will focus on achieving the expected results of the readiness process. They help evaluate the level of the country's progress towards readiness: assessed deforestation and degradation, developed REDD+ strategy, developed reference scenario, operational MRV system, etc. Results indicators will also focus on the stakeholders' participation process and governance improvement in general.

Arrangements

The system will include two main arrangements:

- The steering arrangement, and
- The operational arrangement.

- **The steering arrangement** relies on two foundations:
  - Development of institutional leadership with the objective of ensuring that involved institutions have the capacity to implement the various mechanisms to make the system work. The institutional organization for the implementation of the R-PP monitoring and evaluation system should ensure clear responsibilities of all stakeholders and their capacities to handle indicators and implement identified measures.
  - Implementation of the R-PP, based on a harmonized, varied and structured group of indicators, with the main objective of giving an indication on the progress and the results of the implementation of the various R-PP components. Related institutional arrangements will be established. Such arrangements include a specific independent monitoring and evaluation structure for R-PP implementation, and internal links and links to other institutions, as well as the decentralized level.

- **The operational arrangement** will be based on two intervention directions:
  - Base data collection for indicators defined above
  - Grouping (centralization) and analysis of data provided by the system, to produce:
    - The initial state of each component including the institutional framework, objectives, monitoring and evaluation indicators, and implementation schedule of activities and
    - The semi-annual monitoring statement of implementation of components, including the implementation state of indicators by component.

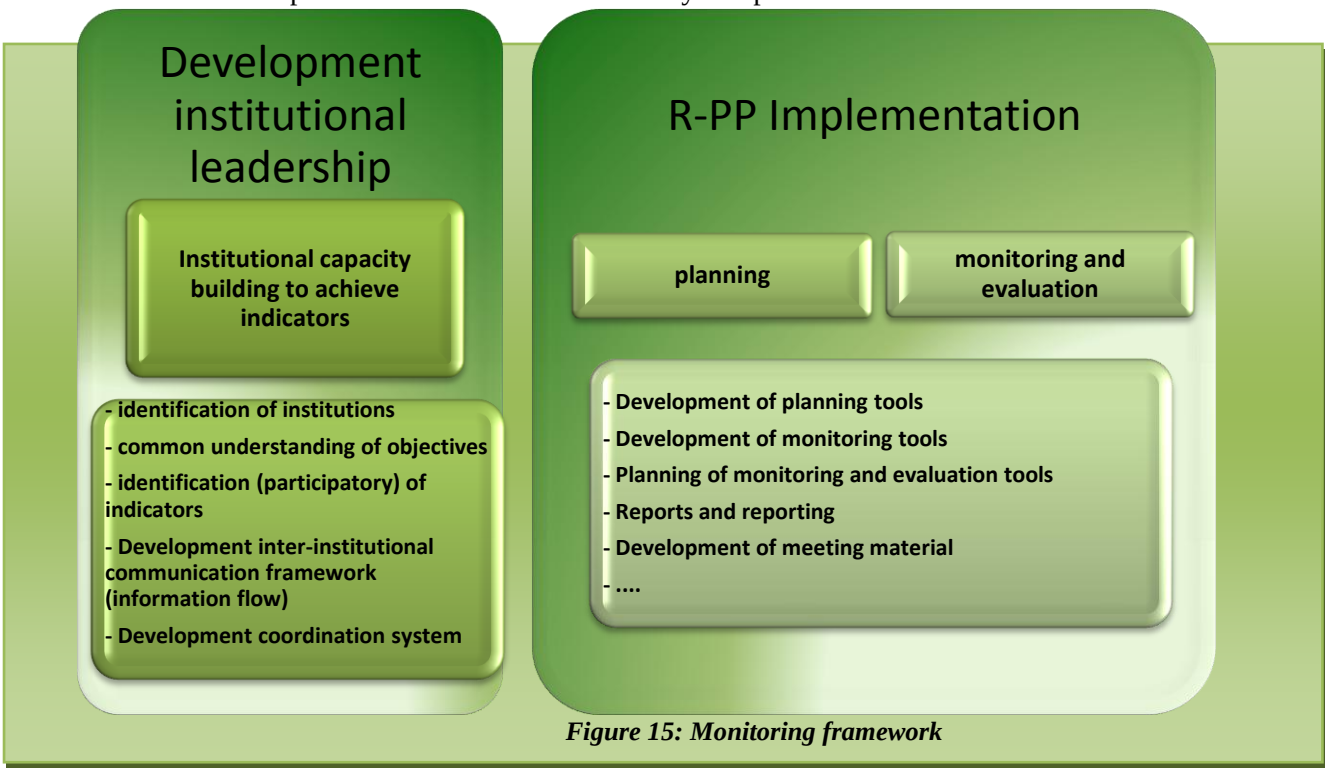


Figure 15: Monitoring framework

Phases

First, the main steps aim at developing in a participatory way the monitoring and evaluation system during the two first quarters of Year 1 of the R-PP, including:

- System design,
- System validation, and
- Deployment for operations.

Second, the monitoring implementation will include:

- Collection of indicators from the beginning of R-PP implementation,
- At the same time as activities,
- During establishment.

Third, the evaluation, including two main phases:

- A mid-term evaluation phase, at the end of the second year of the R-PP implementation, and
- A final evaluation, at the end of the process.

Information cycle

Information on components will be provided to a permanent unit in charge of monitoring and evaluation for the R-PP implementation. Focal points will be designated at regional/ecoregion level to supervise information flow.
The frequency of information flow will be semi-annual.
However, several field missions, programmed and steered by the permanent unit in charge of monitoring and evaluation will take place,

- Either as close monitoring of some components requiring practically permanent technical support due to their complexity; or
- On-demand support for components needing technical support so solve specific problems.

Monitoring program

A manual of procedures on monitoring and evaluation will be produced. It will be the core element of the monitoring and evaluation system to structure monitoring and evaluation activities of the R-PP components.

It should include:

- Necessary information for the initial description of each component, including the following elements:
  - Objectives and sub-components,
  - Time flowchart covering several months for each component, and
  - Objective by component and expected results by monitoring and evaluation indicator for each component
- Task distribution among monitoring and evaluation actors,
- Semi-annual time flowchart of monitoring activities, and
- Mid-term and final evaluation flowchart.

Table 35. Summary of monitoring and evaluation activities and budget

Main activities	Sub-activities	Estimated cost (in thousands US $)			
		Year 1	Year 2	Year 3	TOTAL
MES Implementation	MES design	12.47			12.47
	MES validation	6.20			6.20
	Deployment for MES operations	3.44			3.44
Monitoring	Collection of indicators	8.35	11.13	5.57	25.05
	Processing and analysis	4.00	8.00	6.00	18.00
	Results	4.00	8.00	6.00	18.00
Evaluation	Mid-term evaluation		40.67		40.67
	Final evaluation			40.67	40.67
	TOTAL 6 SSE	38.46	67.80	58.24	164.50