REPÚBLICA DE MOÇAMBIQUE

MITADER

Fundo Nacional de Desenvolvimento Sustentável

R-Package Multi-stakeholder Self-Assessment of REDD+ Readiness in Mozambique

January 2017

Table of Contents

ACRONYMS

AD	National Activity Data
AGB	Aboveground Biomass
ANAC	National Conservation Areas Administration
A/R	Afforestation/Reforestation
BGB	Below ground Biomass
CDM	Clean Development Mechanism
C	Carbon
CF	Climate Funds
DOM	Dead Organic Matter
ECS	Enhancement of forest carbon stocks
EITI	Extractive Industries Transparency Initiative
EF	Emission Factors
EOS	Earth Observation Systems
ER-PIN	Emission Reduction-Program Idea Note
ESMF	Environmental and Social Management Framework
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program
FLEGT	Forest Law Enforcement, Governance and Trade
FNDS	Fundo Nacional de Desenvolvimento Sustentável
FPIC	Free, Prior, and Informed Consent
FREL/FRL	Forest Reference Emission Level /Forest Reference Level
GHG	Greenhouse Gases
GIZ	German Agency for International Cooperation
GLS	Global Land Survey
IIAM	Instituto de investigação Agrária de Moçambique
IPCC	Intergovernmental Panel on Climate Change
JICA	Japanese International Cooperation Agency
LULC	Land Use and Land Cover
M	Monitoring Systems for Forests
MF	FCPF Methodological Framework
MITADER	Ministry of Land, Environment and Rural Development
MRV	Measurement, Reporting, and Verification
NFI	National Forest Inventory
NGO	Non-Governmental Organization
PMR	Pelouro para a Mobilização de Recursos
PMRV	Participatory (Community Based) MRV
REDD+	Reducing Emissions from Deforestation and Forest Degradation, including Sustainable Forest Management, Sustainable Forest Conservation, and Increased Carbon Stocks
R-PP	Readiness Preparation Proposal for REDD+
SAR	Synthetic Aperture Radar
SESA	Strategic Environmental and Social Assessment
SIS	Safeguards Information System
SOC	Soil carbon pools
UEM	Eduardo Mondlane University
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change

UN-REDD	United Nations Program on REDD+
UT-REDD+	Technical REDD+ Unit at the FNDS
WB	World Bank
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund
ZAEN	Mozambican Agro-ecological Zoning

1 Introduction

Mozambique is richly endowed with natural resources – arable land, forests, fisheries, water and mineral resources. Mozambique's substantial natural capital includes 36 million ha of arable land and approximately 45 million ha of natural forests, out of total country size of 80 million ha. This translates into significant potential for agriculture and forestry development for food security and commercial purposes. However, Mozambique's natural resources are being rapidly depleted: 138,000 ha of natural forests are lost every year, and erosion is pervasive. Ensuring the sustainability and resilience of the natural resource base on which agriculture and forestry depend, particularly soil and water, is critical for sustainable development.

The forest cover area is 40 ha (51% of the country), of which almost 27 million ha are categorized as productive forests, suitable for timber production, and over 13 million ha are conservation areas (CAs). Mozambique is internationally recognized for its ecological richness and is home to important biodiversity hotspots with high levels of endemism such as Maputaland (coastal forests in Southern Mozambique), the humid evergreen montane forests in the central Mozambique, and the coastal dry forests in northern Mozambique. Other ecosystems include mopane forests in the semi-arid regions (in the valleys of Limpopo and Zambezi rivers). Mozambique also has East and Southern Africa's largest mangrove forest[1], and the second largest mangrove cover area in Africa, covering around 357,000 ha. Its extensive coastal mangrove forests and sea grasses are mainly distributed along the coastline in deltas, estuaries and protected shorelines, being concentrated in the northern and central regions.

The current Government has publicly recognized forest-related challenges and shown commitment to addressing them. Over the last years a number of remarkable changes took place, which point to a change in direction in the management of the forest sector. A Ministry of Land, Environment and Rural Development (MITADER) has been established, bringing together responsibilities that were previously spread across several ministries, which could facilitate the coordination needed to address challenges of cross-sectorial nature. MITADER adopted several strategic actions to address challenges in the forest sector, including a participatory audit of all forest concessions, the suspension of new requests for exploration areas, a ban on log exports, the updating of forest policies and regulations, and an ambitious project called "*Floresta em Pé"*, which aims to promote sustainable integrated rural development though protection, conservation, valorization, creation and sustainable management of forests.

Mozambique is also in the process of developing and implementing a program for Reducing Emissions from Deforestation and Forest Degradation (REDD+) Program. The National REDD+ Strategy development is informing the Government's approaches to target interventions to key drivers of deforestation and address institutional and capacity gaps. The strategy will orient interventions, targeting Mozambique's key drivers of deforestation in partnership with all relevant stakeholders, as well as highlight important institutional and capacity gaps that need to be filled. The World Bank supports REDD+ readiness through two grants from the FCPF Readiness Fund (USD 3.6M from 2103 to 2017 and an additional $5M from 2016 to 2018).

The **Forest Carbon Partnership Facility (FCPF)** is a global partnership of governments, businesses, civil society, and Indigenous Peoples focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks in developing countries.

Since its inception in 2008, the FCPF has developed a **framework for REDD+ readiness** centered on the robust assessment of country-owned proposals (known as Readiness Preparation Proposals), fostered a domestic policy dialogue on REDD+ (and forests more broadly), and promoted greater cooperation among national and inter- national partners. As of January 2017, 47 forest developing countries (18 in Africa, 18 in Latin America and the Caribbean, and 11 in the Asia-pacific region) are included in the FCPF.

[1] Mangrove forests are known to contain globally significant carbon pools, storing up to five times more carbon than typical upland tropical forests per area.

The Zambezia Integrated Landscape Management Program is one of the two jurisdictional programs established under the REDD+ framework in Mozambique. The program covers nine districts in the Zambezia province – an area of 53.000 km2, of which 66% is covered by forests. The initiative is fully aligned with the strategic plans of the Government of Mozambique whose goals involve protecting and ensuring the sustainable management of natural resources, and promoting the wellbeing in rural areas. The area has been chosen as an **Emissions Reduction Program Area** (ERP Area) due to its high deforestation rate, extraordinary biodiversity, and because it's a high population density area, whose economy depends on agriculture and forest resources. In December 2015, Mozambique, represented by the Minister of Land, Environment and Rural Development signed a Letter of Intent (LoI) with the FCPF Carbon Fund to pay up to 8.7Million tons of emission reductions from this ERP.[2]

The **REDD+ Readiness Framework Assessment** provides a common framework to measure countries' relative progress on core readiness activities. It was developed over two years of discussions in the Participant's Committee (PC) of the FCPF, and informed by country experiences to date in formulating and implementing their R-PPs and existing good practices.

This current document is the Readiness Assessment for Mozambique of December 2016, and has been conducted with inputs from a wide variety of stakeholders.

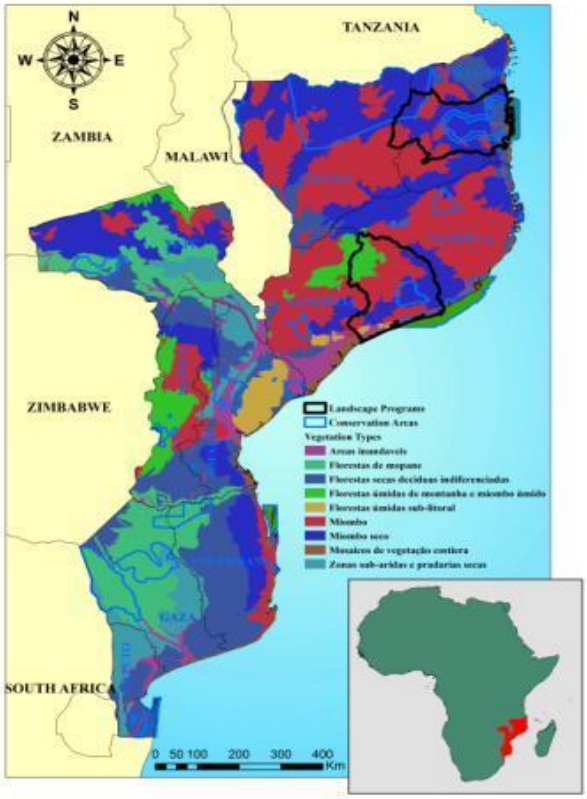


Figure 1- Forests of Mozambique –Ecological Zones

[2] See https://drive.google.com/file/d/0BytyCAOL13LBVnZfQzhVdDdGaXc/view

2 Strategic Vision of REDD+ Implementation in Mozambique

Affirmation on Sustainable Development and the Green Economy

A new government took office in February 2015, after general elections. The new administration adopted a Five Year Government Plan (Plano Quinquenal do Governo) 2015-19 (PQG) for economic and social development.[3]. The Plan's 5th strategic pillar is focused on transparent and sustainable management of natural resources and the environment. Among the strategic objectives is to "ensure the integration of the Blue/Green Economy and Green Growth agenda in national development priorities, ensuring conservation of ecosystems, biodiversity and the sustainable use of natural resources."

The current Government has publicly recognized forest-related challenges and shown commitment to addressing them. Over the last years a number of remarkable changes took place, which point to a change in direction in the management of the forest sector. A Ministry of Land, Environment and Rural Development (MITADER) has been established, bringing together responsibilities that were previously spread across several ministries, which could facilitate the coordination needed to address challenges of cross-sectorial nature. MITADER adopted several strategic actions to address challenges in the forest sector, including a participatory audit of all forest concessions, the suspension of new requests for exploration areas, a ban on log exports, the updating of forest policies and regulations, and an ambitious project called "*Floresta em Pé"*, which aims to promote sustainable integrated rural development though protection, conservation, valorization, creation and sustainable management of forests.

These priorities and strategic objectives are also reflected in MITADER's National Sustainable Development Program, which provides the key linkages between country priorities and REDD+. Strengthened by the mandate, mission and vision of the newly established MITADER ministry, the National Sustainable Development Program aims to achieve the broad goals and strategies reflected in the PQG by outlining key actions and projects to be implemented in rural Mozambique. Importantly, this vision includes MITADER's Terra Segura (Secure Land) Project, aimed at registering 5 million parcels and completing 4,000 community land delimitations, as well as Floresta em Pé and a variety of other interlinking rural development initiatives from rural banking to water to infrastructure etc.[4]

The REDD+ Program currently underway **contributes to meeting the country´s international commitments** for the **United Nations Framework Convention on Climate Change**, including the country´s **Intended Nationally Determined Contribution** (INDC) as per the Paris Agreement, delivered to the UNFCCC in November 2016, in which Mozambique made targets for total reductions of about 23MtCO2 from 2020 to 2024 and 53.4 MtCO2 from 2025 to 2030. The Project's integrated landscape management approach embodies many of the new **Sustainable Development Goals** (SDG-1, 8, 13, 15, 17) and is aligned to the **Africa Climate Business Plan**, **the African Forest Landscape Restoration Initiative (AFR100) and Bonn Challenge.** Under the scope of the AFR100, launched in 2015 in support to the Bonn Challenge for restoration of degraded land, the GoM has committed to restoring 1 million ha of degraded land by 2030.

Programs and projects currently existing or in development in Mozambique which are directly related to the REDD+ program include the Forest Investment Program, the Zambezia Landscape Integrated Landscape Management Program, the Dedicated Grants Mechanism, and the MozBio Conservation Support program, all with support from the World Bank Group, the Quirimbas National Park and Gilé National Reserve Climate Change adaptations programs funded by the French Development Agency and the FFEM, UNDP/GEF/UNEP´s

[3] Resolution No. 12/2015 of April 14.

[4] Other five key priorities within the scope of the National Sustainable Development Program are: (a) knowledge and technology transfer (*Mais Saber)*; (b) market-related infrastructure (*Via Rural)*; (c) access to finance and financial services (*Um Distrito, Um Banco)*; (d) improved water supply (*Agua Viva*); and (e) expanded energy supply (*Quinta da Energia*) in rural areas.

support to some WWF initiatives on Mangrove and Blue Carbon, and Sweden´s support to forest sector initiatives.

The REDD+ Mechanism Supporting Sustainable Development in Mozambique

The miombo forest provides a variety of biophysical ecosystem goods and services to local communities, including food, fuel, medicine and construction materials. Communities depend significantly on forests. While forests provide 4% of GDP at a national level, it is estimated that in some areas, for example in the Gorongosa district, miombo woodlands contribute about 19% of household cash income and 40% of the household subsistence (non-cash) income. Fuelwood and charcoal are critical to national and household energy needs, with over 70% of the population depending on it for cooking, resulting in an annual consumption of almost 25 million m^3 of fuelwood (including charcoal, which is mostly used in urban areas). Non-timber forest products are significant contributors to nutritional and medicinal needs, and have significant potential to generate income.[5] Forests also act as a safety net for populations by providing secure access to resources and services. These include the ecological services upon which agriculture and food security depend, such as erosion control, water for irrigation, and stable soils, which can come under threat from weather and climatic variation.

The miombo forests also provide significant ecosystem services of global value, particularly carbon sequestration and storage, water regulation services and biodiversity habitat. Miombo forests constitute important reservoirs of above- and below-ground carbon, having significant potential as a carbon sink, especially in soils and woody biomass. The above- and below-ground carbon stock of the miombo is estimated to be 227 tCO_2/ha (ETC Terra, 2016)[6] . Miombo forests are also an important habitat for a variety of herbivores and carnivores, including large terrestrial mammals, some of which are endemic to Mozambique and others endangered.

Forests contribute directly to resilient and productive landscapes. Mozambique is one of the highest ranked African countries in terms of exposure to risks from weather-related climate hazards (drought, floods and tropical cyclones). The country's low adaptive capacity and the strong dependence of its population and economy on natural resources exacerbate its vulnerability to climate change. The growing intensification of weather hazards threatens efforts to meet national priorities, especially toward food security, which is essential to poverty alleviation. Deforestation and forest degradation increase vulnerability of rural communities to changing climatic conditions, particularly by making forests more prone to fires. On the other hand, well-managed landscapes[7] can provide resilient livelihoods in the face of erratic weather trends and buffer communities from natural disasters.[8] Healthy forests, and trees in agriculture lands, are a key piece in sustainable landscapes. Land restoration through planting trees, such as through agroforestry schemes, can increase the adaptive capacity of communities as well as lead to diversification of livelihoods.[9]

---

[5] The study "Assessment of Non-Timber and Non-Wood Forest Products Value Chain in the Zambezia, Nampula and Cabo Delgado Provinces, Mozambique" (2015) conducted by PhytoTrade for the GoM showed that there is potential for NTFP development in the areas of the Project, coupled with the desire by communities for this for diversification of livelihood.

[6] Study on the Zambezia Integrated Landscape Management Program, EtcTerra (2016)

[7] The term "landscapes are used in this PAD refer to a defined geographic area where multiple land uses and demands in different sectors occur, and where multiple actors have a stake in the land and the resources. The landscape approach is central to the Project—an approach that addresses the complexity of a landscape, and attempts to integrates policy and practice for multiple land uses within a given area to ensure equitable and sustainable use of land while strengthening measures to adapt to climate change, and mitigate it when possible.

[8] Climate Change and Forest Resilience, IIED, 2006

9 How Forests Enhance Resilience to Climate Change, PROFOR, 2015

3 Summary of the REDD+ Readiness Process

No.	Criteria	Jan 2017
	Subcomponent 1a - National REDD+ Management Arrangements	
1	Accountability and transparency	
2	Operating mandate and budget	
3	Multi-sector coordination mechanisms and cross-sector collaboration	
4	Technical supervision capacity	
5	Funds management capacity	
6	Feedback and grievance redress mechanism	
	Subcomponent 1b - Consultation, Participation, and Outreach	
7	Participation and engagement of key stakeholders	
8	Consultation processes	
9	Information sharing and accessibility of information	
10	Implementation and public disclosure of consultation outcomes	
	Subcomponent 2a- Assessment of Land Use, Land Use Change Drivers, Forest Law, Policy and Governance	
11	Assessment and analysis	
12	Prioritization of direct and indirect drivers/barriers to forest carbon stock enhancement	
13	Links between drivers/barriers and REDD+ activities	
14	Action plans to address natural resource rights, land tenure, governance	
15	Implications for forest law and policy	
	Subcomponent 2b - Strategy Options	
16	Selection and prioritization of REDD+ strategy options	
17	Feasibility assessment	
18	Implications of strategy options on existing sectoral policies	
	Subcomponent 2c - Implementation Framework	
19	Adoption and implementation of legislation/regulations	
20	Guidelines for implementation	
21	Benefit-sharing mechanism	
22	National REDD+ registry and monitoring system	
	Subcomponent 2d- Social and Environmental Impacts	
23	Analysis of social and environmental safeguard issues	
24	REDD+ strategy design with respect to impacts	
25	Environmental and social management framework	
	Subcomponent 3 - Reference Emission Level	
26	Demonstration of methodology	
27	Use of historical data and adjustment for national circumstances	
28	Technical feasibility of the methodological approach, and consistency with UNFCCC/IPCC guidance and guidelines	
	Subcomponent 4a - National Forest Monitoring System	
29	Documentation of monitoring approach	
30	Demonstration of early system implementation	
31	Institutional arrangements and capacities	
	Subcomponent 4b - Information system on multiple benefits, other impacts, governance, and safeguards	
32	Identification of relevant non-carbon aspects, and social and environmental issues	
33	Monitoring, reporting and information sharing	
34	Institutional arrangements and capacities	

Table 1 - Summary of REDD+ Readiness in Mozambique

Comparison with Mid Term Review Classifications

Criteria	MTR	Self-Assessment (R-Package)	Stakeholder Opinion 2017
Subcomponent 1a **-** National REDD+ Management Arrangements			
Subcomponent 1b **-** Consultation, Participation, and Outreach			
Subcomponent 2a- Assessment of Land Use, Land Use Change Drivers, Forest Law, Policy and Governance			
Subcomponent 2b **-** Strategy Options			
Subcomponent 2c **-** Implementation Framework			
Subcomponent 2d- Social and Environmental Impacts			
Subcomponent 3 **-** Reference Emission Level			
Subcomponent 4a **-** National Forest Monitoring System			
Subcomponent 4b **-** Information system on multiple benefits, other impacts, governance, and safeguards			

Table 2 - Comparison with Mid Term Review Classifications

An initial comparison of the results of the participatory evaluation during the R-Package and the Mid-Term Review demonstrates advances in all aspects considered, although some areas are still under development.

Indeed, Mozambique has made such significant progress that it is already beginning implementation activities in several pilot landscapes. Due to this progress, the stakeholder workshop held in January 2017 focused to a large extent on the issues and challenges of implementation. For this reason, some items were classified more harshly by the stakeholders than the national self-assessment. The two main reasons for this in our view are: (i) a focus by stakeholders on the implementation phase rather than the Readiness phase; and (ii) a lack of time to have fully absorbed the recently finalized and approved REDD+ National Strategy and Action Plan. The details of these divergences are discussed in detail in Section 4.2.

When the focus is kept exclusively on the Readiness Process, the government of Mozambique is firmly of the opinion that significant and relevant progress has been made in all areas since the Mid Term Review was concluded.

3.1 Component 1a: National REDD+ Readiness Organization and Consultation

Management and Implementation of the Process (Institutional Arrangements)

MITADER's National Sustainable Development Fund (*Fundo Nacional de Desenvolvimento Sustentável* - FNDS[10]) is responsible for overall strategic guidance and coordinates REDD Program implementation. The lead unit for Program coordination in MITADER's FNDS is its Directorate for the Mobilization of Funds (PMR - *Pelouro para a Mobilização de Recursos*, formerly known as the International Funds Management Unit (*Unidade de Gestão de Fundos Internacionais*, UGFI)). FNDS is responsible for the technical and financial coordination of the Program, and works closely with some of MITADER's technical directorates, mainly the National Directorate of Forests (DINAF), the National Directorate of Land (DINAT), the National Agency for Environmental Quality Control (AQUA) and the National Agency of Conservation Areas (ANAC). On REDD+ issues the FNDS also liaises with other ministries such as the Mini1stry of Agriculture and Food Security (MASA) and the Ministry for Mineral Resources and Energy (MIREME), amongst others.

With the adoption of the **Decree No. 70/13** of December 20th, 2013, "Regulation of the procedures for approval of projects for reducing emissions from deforestation and degradation" the main structures of REDD+ were formalized at the national level through the **institutionalization of the Technical Unit of REDD +** (UT REDD+) and the Technical Committee of Review (CTR)/ National REDD+ Steering Committee. The structure approved by this Decree is in line with the proposal in the R-PP. With the restructuring of government institutions, as a result of the legislative and presidential elections of 2014, the staff and functions of the UT-REDD are now under the subordination of the Ministry of Land, Environment and Rural Development (MITADER), and has been placed inside of the FNDS.

Program implementation is carried out by the PMR (housed within the FNDS) at the central level. The PMR is tasked with the implementation of all REDD+ projects, including technical supervision and coordination, overall planning, quality oversight, communication, safeguards management, reporting, procurement, financial management, monitoring of activities and monitoring and reporting on progress on a regular basis. At the central level, the FNDS is responsible for the management of fiduciary issues, in conformity with the standards and requirements contained in the legal agreement and agreed upon with the WBG. The PMR Coordinator has appointed a full-time Project Coordinator for the REDD+ Readiness activities, who also coordinates the MozFIP project, the government´s Forest Investment Program, which is being used to implement the REDD+ Strategy. The PMR project management team includes a financial manager, a procurement specialist and an accountant, as well as a monitoring and evaluation officer, communication specialist, safeguards specialist, and technical specialists for coordination of the following areas of expertise: natural forests; plantations and reforestation; land; agriculture; biomass. The PMR coordinates the work of the Focal Points from the Ministries to ensure their regular participation in the implementation of REDD+ activities. In addition to participating in the preparation of various projects´ activity plans, the Focal Points participate in site visits and in discussions with service providers and local authorities.

[10] FNDS was created on Feb 24, 2016, and it has the objectives to promote and finance programs and projects that support the sustainable development. FNDS has 4 units: finance, investments, planning and the Funds Mobilization unit.

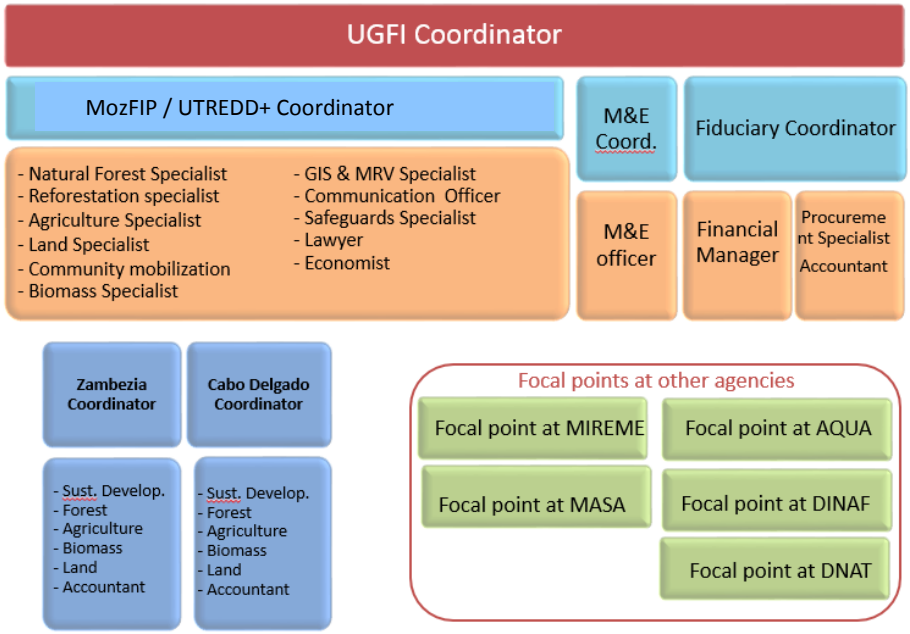


Figure 2 – UTREDD+ team

Oversight. The Technical Review Committee (CTR)/ National Steering Committee of REDD+ is the means of consultation and supervision of REDD+ activities. It is also the structure responsible for producing technical allowances for the UT-REDD+. The CTR includes representatives from the Ministry of Culture and Tourism, Ministry of Gender, Ministry of Education, Child and Social Action, Ministry of Industry and Commerce, Ministry of Economy and Finance, Ministry of State Administration and Public Function, Ministry of Justice, Constitutional and Religious Affairs, and Ministry of Mineral Resources and Energy, as well as by representatives from the private sector, NGOs and research institutions

To oversee the implementation of the MozFIP and MozDGM activities which are being used to implement the REDD+ Strategy a **FIP National Steering Committee** has been created and a DGM Steering Committee is in the process of being created. The FIP Steering Committee comprises government organizations, the private sector, research institutions and civil society organizations, and has the overall mandate to support PMR in strategic decision-making around the FIP. The FIP National Steering Committee will, among other tasks: coordinate activities under the overarching investment plan; provide inputs to the annual work plans, budgets and reports; ensure alignment between the FIP and other government programs; liaise with development partners and relevant stakeholders; and advise on strategies and mechanisms for conflict resolution and improved management of forest resources. To further strengthen the link between the steering committees, the FIP Steering Committee will coordinate with the DGM National Steering Committee on a regular basis.

At the regional level mutistakeholder forums have been set up in Zambezia and Nampula, which include private sector, government and NGO representatives, and which play a key role in discussing and disseminating initiatives to reduce carbon emissions and increase carbon stocks. In Cabo Delgado a similar function is played by the previously existing Technical Group on Natural Resources.

Coordination Mechanisms

The PMR also coordinates with the following National Directorates in other line ministries: Ministry of Agriculture and Food Security (MASA), through the National Directorate of Agriculture and Planted Forests (DNAS), the National Directorate of Agrarian Extension (DNEA), and the Ministry of Mineral Resources and

Energy (MIREME) through the National Energy Fund (FUNAE). Each Agency and National Directorate has appointed a Focal Point who participates in Program activities including in the preparation of the annual work plans and budgets, annual progress reports, prepare terms of references (TORs) in their respective areas of expertise, and contribute to the supervision of the actions under their areas of responsibility.

Integration of REDD+ into broader national or sector strategies

Mozambique has established policies and institutions that allow it to implement various measures for reducing deforestation and forest degradation. The main focus of forests and environment can be found in the **Constitution of the Republic of Mozambique** (CRM) (Government Mozambique, 2004). According to the CRM, the State adopts policies aimed at "ensuring the Rational use of natural resources while safeguarding their capacity for renewal, ecological stability and the rights of future generations "(Article 117, 2 (d)). Moreover, in paragraph 2 of its Article 90, the CRM establishes that "the State and local authorities, with the collaboration of environmental NGOs, shall adopt policies to defend the environment and ensure the rational natural resources ". Finally, in Article 102, it states that "the State shall promote the Knowledge, inventory and valorization of natural resources and determine the conditions of their use and exploitation safeguarding national interests".

The **National Development Strategy (2015-2035)** recognizes that climate change can significantly affect the activities defined as priorities for development. Therefore the strategy emphasizes the need to invest in resilience to climate change with a view to reduce losses and damage, with particular emphasis on agriculture, tourism and infrastructures.

The **Five-Year Government Program (PQG 2015-2019)** (Government of Mozambique, 2015) has as one of its 5 priorities "to ensure the sustainable and transparent management of natural resources and the environment". One of the strategic objectives of the GCP for the period 2015-2019 is "to ensure the integration of the Blue/Green Economy and the green growth agenda in national development priorities, ensuring the conservation of ecosystems, biodiversity and the sustainable use of natural resources." This objective includes a wide range of actions for the conservation of forests and Ecosystems in general, the promotion of sustainable management as well as the integration of local communities in the development process.

Other important policies are the **National Program for Sustainable Development** 2015-2030, the **National Reforestation Strategy** (2009), and the **Biomass Energy Strategy** (2013).

Mechanisms for multi-sector coordination in the area of the environment have been created before the establishment of REDD+ with the creation of the National Council for sustainable development (CONDES) by means of the approval of the Decree 40/2000 of 17th October, and composed by representatives of government institutions and civil society organizations including the Private Sector Forum for the Environment (FEMA) , The National Union of Farmers (UNAC), Biodiversity and Sustainable Development Association (ABIODES) Medical Association, National Association of Journalists (SNJ) Women's Forum and Association of Municipalities. The CONDES is a consultative body for environment and social safeguards to the investments in the sector. It deals with the harmonization of policies and implementation policy grants, strategies, plans and national programmers related to adaptation and mitigation of climate change.

One of the main activities of the CONDES is to carry out a review of the legal instruments related to natural resources and the environment and submit them to the Council of Ministers for their approval. The CONDES have a clear mandate in respect to strategies allowance and political support to REDD+ in the context of sustainable development of the country and, by virtue of powers it is up to this body the final pronouncement on these matters. Its multi-sector composition and integrating different stakeholders is a fundamental premise for ensuring multi-sector coordination. It is expected that the CONDES starts its activities within the framework of REDD+ with the appreciation and approval of the REDD+ strategy.

At a sector level, the PMR is the body designed by the Ministry to coordinate all international funding support, which thus requires coordination of the various sectors making up the Ministry, as shown above.

Feedback and Grievance Redress Mechanism

To inform the National REDD+ Strategy, with environmental and social dimensions relating to current standard of land use and forest management, the GoM has concluded a final draft of a Strategic Environmental Assessment (SESA) including a Environmental and Social Management Framework (ESMF) and a Process Framework (PF). The safeguards instruments are an integral part of the FCPF requirements for countries participating in REDD+ and requires broad consultation with stakeholders including communities and other forest-dependent communities. Public consultation were carried out to facilitate gathering and assessing community feedback and opinions on REDD+, MozFIP, and MozDGM in the country, particularly at two landscapes (Zambezia and Cabo Delgado), but also and perhaps most notably, maintain a constructive relationship with affected communities over the life of the various projects (MozFIP, ZILMP, Dedicated Grant Mechanism (DGM), etc.) and REDD+ activities.

A feedback and Grievance Redress Mechanism for the FIP and DGM has been finalized and is included as part of the Process Framework, and serves as the model to be used during the implementation of other REDD+ projects. The model can be seen below.

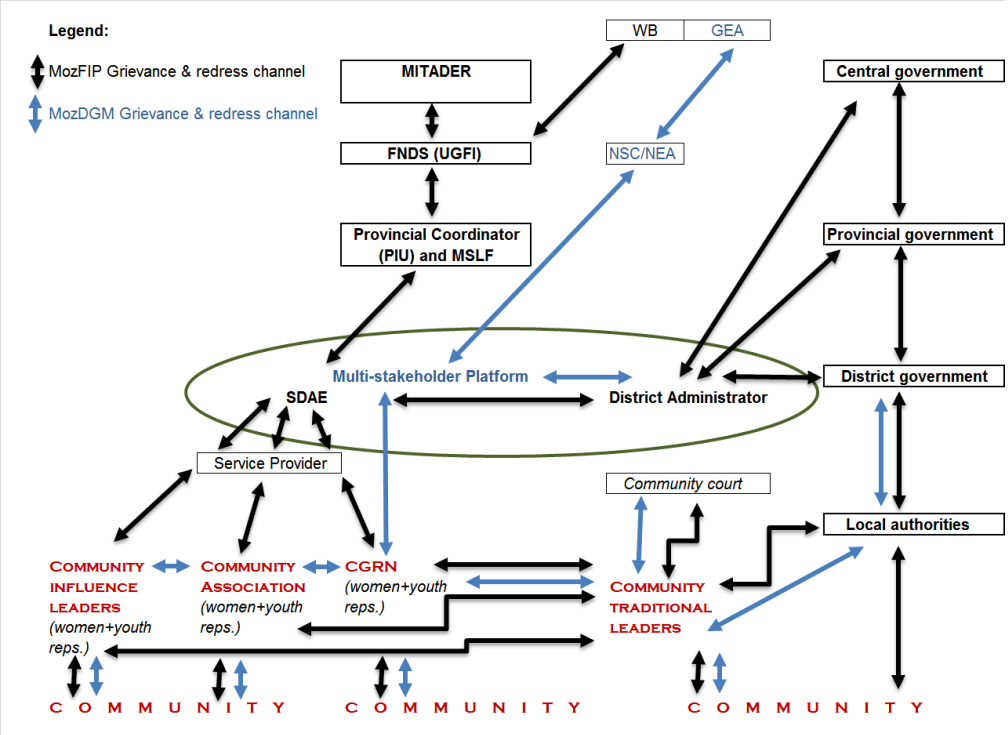


Figure 3 - Grievance and redress channels

Relevant Documents for consultation:

Relatório Final do Estudo sobre o Quadro Legal e Institucional para o REDD+

Framework for Environmental and Social Management for REDD+ in Mozambique

Plano de Investimento do FIP

ESMF for MozFIP DGM REDD+ initiatives

PF - Process Framework update to cover the National REDD+ (FIP, DGM) initiatives

Assessment

The government of Mozambique regards this subcomponent as Green. However, it must be noted that the stakeholders meeting considered this only as Yellow.

The reasons for stakeholder´s lower ranking of Subcomponent 1a appear to be linked to the greater emphasis placed by the participating stakeholders on the lack of understanding of the roles in implementation for the various other state bodies vis-a-vis the FNDS/UTREDD. The changing position of the UTREDD and UGFI from being a unit within the Ministry of Land, Environment and Rural Development, with direct line management from the Minister, to being a Directorate (the Pelouro para a Mobilização de Recursos) within the newly reformulated Fund for Sustainable Development (FNDS) has not helped to clarify this division of responsibilities and authority.

However, these concerns are primarily concerned with implementation issues, not readiness, which all generally agree has been achieved. In fact, even at the Mid Term Review stage, this sub-component had been considered as green, and these reasons are put forward by the government to justify the current evaluation.

3.2 Sub-Component 1b. Consultation, Participation, and Outreach

Information sharing and stakeholder consultation and participation

The **public consultation process** was designed to facilitate gathering and assessing multi-stakeholders feedback and opinions on REDD+ in Mozambique, Preparation and implementation of FIP and DGM project, but also and perhaps most notably, maintain a constructive relationship with affected communities over the life of the REDD+. Specifically, the consultation process was designed and implemented to:

- Verify stakeholder representatives;
- Ensure that the individuals from particular stakeholder groups are representative of the views of that group;
- Collect community opinions on the REDD+ initiative, FIP and DGM Projects focusing on the anticipated negative and positive impacts of the program;
- Engage the local communities, stakeholders and local government in consultation to inform development and operations of the projects; and
- Report on the issues and opinions raised during community consultation session;

To ensure this, an **extensive consultation process** was conducted throughout the Readiness process, and is still being in place during the implementation of the activities. It has included national level, provincial-level, and community consultations, as well as specialized groups on specific topics.

From March 2013 until November 2016, the Government held 61 consultations covering six provinces in the three main regions of Mozambique. In the South: Maputo and Gaza; In the central region: Zambézia and Sofala; And in the northern zone: Cabo Delgado and Nampula. In total, 3370 participants were involved, of which 2392 were men and 978 women.

The geographic coverage of consultation was limited to provinces and communities where REDD+ initiative, FIP and DGM projects have been proposed to be implemented, or where REDD+ initiatives are already being implemented. The meetings were geographically divided into three levels:

Central Level – in Maputo, the Capital of Mozambique. The consultation at this level targeted representatives of central institutions relevant for REDD+. Workshops and key informants interviews were used to discuss REDD+ broader policy, strategic issues and meetings for FIP/DGM project design. Maputo city have a convergence of relevant REDD+ actors such as the donor community, policy-makers, advocacy organizations, private sector representatives, major academic institutions and others.

Provincial Level – in the provinces of Zambézia, Cabo Delgado, Nampula, Sofala, Gaza and Maputo (i.e. in 6 of the 10 provinces). Stakeholder workshops were held with representatives from relevant institutions- government, private sector, CSOs, academia and others. The aim of these workshops was to present scenarios and undertake a joint assessment of potential impacts and preliminary identification of mitigation measures.

Community Level – in different communities of the Provinces of Zambézia, Cabo Delgado, Nampula and Gaza.

The consultation process was implemented within the context of international and national principle governing REDD+ namely the World Bank guidelines for stakeholder engagement and Mozambican legislation. The FCPF provides the requirement for effective stakeholders' engagement emphasizing local communities and forest dependent communities; the Mozambique law (Ministerial Diploma 158/2001) and the regulatory framework for REDD+ (Decree 73/2013) establish the need for local communities consultation. These two and other applicable regulations set the boundaries for implementation of this public consultation process.

Main Themes consulted on

The table below provides a summary of major themes consulted on, along with the issues and respective target stakeholders:

Themes	Key issues for consultation	Key target stakeholders	Examples of Community Concerns / Contributions
Understanding drivers of deforestation and degradation	• Deepening the understanding on causes and drivers of deforestation and degradation with links to REDD+ programs • Mitigation measures and strategies to slow down the current rate of deforestation • The pros and cons of proposed mitigation measures and strategies	Communities, local government and NGOs, private sector	• The drivers of deforestation and degradation recognized by the communities are not much different than the drivers identified in the literature: slash & burn agriculture, illegal logging, and in the north, burning is conducted to flush out game for bush meat. Burning is also conducted for road rehabilitation and road clearing and at times burns out of control.
Land use and land tenure	• Understanding potential impact of REDD+ on land use/tenure given the incentive provides (cash) • What would be the mitigation measures • Can REDD+, FIP and DGM be applied as designed? • If not, what changes to be made to adjust to local context?	Communities, local government and NGOs, private sector	• There were no reports of land conflicts deriving from the implementation of REDD pilot projects. • The use of the forest varies by age group and gender; with young men (18-35 years of age, especially men) using forest intensively for market purposes and in some instances with lucrative illegal logging • Older people, both men and women, tend to have a traditional connection to forest- they do not use it as intensely as the young men • Forest for medicinal purposes was reported across all demographic groups

Social and environmental protection	• Understanding the social impacts of REDD+ initiatives, FIP and DGM project implementation • Appropriate mechanisms to mitigate the impacts • How can these impacts be monitored?	Communities, local government and NGOs, central government , private sector	• Community members noted that the REDD+ reforestation projects are one of the key alternatives to replace their heavy reliance on forest resources for survival. They recognize the need to replant trees in areas that have been deforested, and they would like jobs participating in the reforestation project. • In addition to reforestation projects, it would be beneficial if individuals could participate in commercial agriculture.
Sustainable forest management	• Understanding the current economic, social and environmental value of forest and the implications for future generations	Communities, local government and NGOs, central government , private sector	• Under the existing REDD+ pilot projects, conservation agriculture is being introduced by external sources. The concepts and ways of farming are new to the people in the region, and in many ways clashes with local land use/forest use traditions. It will take time to raise awareness for the need for change, and to get people to accept the conservation programs and adopt them. • Community members recommend establishing local committees responsible for managing all burning activities that occur in the area.

Table 3 - Main Themes consulted on

In numeric terms, the following is a summary of all the consultations that have taken place to date (to end of November 2016). All lists of participants for the meetings held related to REDD+ initiative, DGM and FIP Program can be found in the link www.redd.org.mz.

	Nº of Consultations	Participants (of which female)
National Level	27	959 (379)
Provincial Level Consultations	24	1612 (351)
Communities	10	799 (248)
Total	61	3370 (978)

Table 4 - Geographic and Demographic coverage of the consultations

Specific Engagement of Women and other Marginalized Groups

In the context of the preparation of REDD +, consultations, particularly at the community level, have always taken into account the participation of women and vulnerable groups, which are relevant to sustainable forest management. Specifically, groups of adults, young people, the elderly and women were separated as a means of ensuring better participation and contribution of stakeholders, as can be seen in the example below:

Province	District	Communities	Male participation			Female participation		
			Adults	Elderly	Youth	Adults	Elderly	Youth
Cabo Delgado	Quissanga	Nacoja	23	29	40	55	31	0
		Montepuez	19	42	19	21	0	0
	Macomia	Bangala II	26	15	0	20	0	0
	Meluco	Massasse & Nguya	16	11	28	23	0	0
Zambézia	Pebane	Muceia	35	0	18	17	0	0
	Gilé	Namarrua	42	0	52	23	0	0
Gaza	Mabalane	Mavumbuque	21	5	11	30	0	0
		Chaves	27	0	0	11	4	7
Total			**209**	**102**	**168**	**200**	**34**	**7**

Table 5 - Demographic coverage of community consultations

At the central level, a specific consultation on gender mainstreaming in the sustainable management of natural resources was carried out, with the aim of reinforcing the intervention and contribution of women in the process.

However, this engagement process needs particular attention because in the rural areas in the country, especially in the coastal areas of the Landscapes, women have the highest rates of illiteracy, and due to the fact that cultural and religious reasons lead to lower participation which is therefore of concern. In order to ensure greater involvement of women, the Mozambican Rural Women's Movement (MMMR) was specifically encouraged to take part in the provincial platforms.

Consultation Process and the Use of its Results

Engaging a wide range of stakeholders throughout the development of the FIP and REDD+ Strategy has generated a range of questions, recommendations and concerns. All contributions that were received, both through the online and in-face consultations, were systematized and taken into consideration during the process of finalizing the strategy.

Dissemination of Information

The reports of activities, including periodic reports of UT-REDD+ to the World Bank (Country Progress Report) and a report on the dissemination of the Decree No. 70/13 and R-PP are available on the website of the FCPC and UT-REDD+. There is also information sharing of the group members of REDD+ through four distinct "Google groups" (REDD+, Zambezia, MRV, DGM). The UT-REDD+ has organized regular meetings of harmonization of the strategy where teams of thematic studies presenting the status of the activities, and partner institutions present their activities and potential synergies.

Beyond these mechanisms there has been a regular and intensive series of consultations on the various products produced by UT-REDD+. In order to ensure a large number of participants in consultations, the Government made invitations and information available to stakeholders through both the REDD+ website, Facebook page as well as through bilateral invitations. Reports from the consultations with accompanying participants lists have been well documented and are publicly available on the REDD+ website (www.redd.org.mz).

In terms of non-digital mechanisms, designed for to incorporate the reality that rural communities do not always have access to digital media, the consultation process in the communities developed radiophonic pieces for community radio stations on the reduction of deforestation and forest degradation. The pieces also include topics such as conservation agriculture and sustainable use of biomass energy. Theatrical appearances on the same themes as well as on uncontrolled fires were another means of dissemination and sensitization at the community level. The devolution and dissemination process of information to the communities was however recognized as the weakest element within the communication strategy, and so with the establishment of the PIU in the Landscapes, one of the key tasks is to create more permanent forums for dialogue between local communities and the technicians and allow greater flow of information though appropriate language, formal and non-formal encounters.

Role of the Participatory Platforms

At the National level, the existing platform is constituted by the National Steering Committee (NSC) which is composed of two chambers: (i) the Deliberative Chamber formed by Natural Resources Management Committee (CGRN) members (6 chairs) and local civil society representatives (5 chairs); and (ii) the Consultative Chamber formed by Academia (2 chairs), GoM (3 chairs and 1 from FNDS/FIP Coordination), national and international NGOs (6 chairs at minimum) and World Bank (1

chair). The Consultative members aim to provide multidisciplinary advisory and advocacy support. Within the NSC, members from Deliberative Chamber were elected by landscape forum and they considered CGRN and civil society representatives as candidates. Vulnerable groups within territorial coverage of the project have been taken into account, within the CGRN. The south, center and north of Mozambique are represented in the NSC. The Consultative Chamber members were selected by the Deliberative Chamber. The Consultative Committee invited all initial participants and throughout votes were selected the deliberative members.

Two Landscape-level platforms for dialogue among the key actors for the integrated management of projects under development in the landscape have been created, in Zambezia and Cabo Delgado Provinces. The objective is to promote and facilitate discussion, negotiation and joint planning on aspects of sustainable landscape development. Different actors participate in the platform, involving community leaders, civil society, development agencies, government and investors. Quarterly meetings are held where information is shared on the different initiatives under development in the landscape.

Relevant Documents for consultation:

Environmental and Social Management Framework for REDD+ in Mozambique

Stakeholder Engagement Report for the REDD+ SESA

Summary Report Public consultations for REDD+ activities and MozFIP/MozDGM Projects

Planilha das Consultas Públicas

Facebook REDD+

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements, and should therefore be classified as green in the current assessment.

3.3 Subcomponent 2a. Assessment of Land Use, Land-Use Change Drivers, Forest Law, Policy, and Governance

Analysis of the Drivers of Deforestation[11] and Links with REDD+ Activities

Deforestation and other forms of change of land use represent about 80% of total national greenhouse gas emissions, making it the main contribution of Mozambique to climate change (MICOA, 2012). A recent study of the causes of deforestation (CEAGRE and Winrock International, 2016), using global mapping information (Hansen, et al., 2013) with reference to the period 2000-2012, estimated the **deforestation rate at 138 thousand hectares per year (0.23%)**, which represents about 12 MtCO 2 emissions/ year.

The major drivers of forest loss and degradation occur both within the forest sector and in other non-forest sectors, namely in agriculture and energy (Winrock, 2015, Argola, 2004, Marzolli, 2007, Mananze, 2012 Nhantumbo et al 2013). Within the forest sector, the **direct causes** are unsustainable commercial timber exploration and unsustainable extraction of wood for domestic uses, particularly charcoal. Selective and unsustainable illegal logging leads to the degradation of native forest stands. Outside of the sector, forest conversion into agriculture is the dominant driver of deforestation outside of the sector. This includes commercial agricultural expansion, shifting subsistence cultivation and livestock.

Small-scale agriculture (65% of total Emissions). Shifting cultivation, both for subsistence farming and cash cropping, is the dominant direct deforestation driver. Of 3.8 million farms inventoried in the 2011 agricultural census (INE, 2011), 99% were small-scale (average size of 1.4 ha), occupying 96% of cultivated land. When accompanied by a growing population and increased demand for food in the rural areas, small-scale agriculture increases pressure on arable land, leading to the opening of forest areas. Limited access to markets and technologies that enhance productivity exacerbate demand on the land. The practice of using fires to prepare fields has often resulted in uncontrolled fires, leading to biodiversity and carbon loss.

Forest Degradation

Natural Forest Timber Production (8% of total Emissions). The exploitation levels of hardwood species from natural forests are exceeding the annual allowable cut volumes, caused by a variety of unsustainable forest management practices in the sector. These include Illegal logging, lack of adherence to management plans by concessionaires and license holders, and weak enforcement in the forest sector. While the direct impact from natural forest exploration is degradation, this can enable deforestation, for instance through the opening of access roads. The volume of export-oriented illegal logging has surged in the past few years: statistical analysis conducted by the Environmental Investigation Agency (EIA, 2014)[12] estimated that 93% of all commercial logging was illegal in 2013, and an average of 81% between 2007 and 2012, a potential loss of US$146 million of foregone government revenues in the period. Timber theft also entails significant losses to local communities who are entitled to receive 20% of concession taxes.

Forest governance and enforcement. Improving forest governance to curb illegal logging is therefore a key challenge in Mozambique. There is a significant lack of both physical and human resources, with roughly 1 law enforcement official (*Fiscal*) for every 50.000 ha, where the ideal number stipulated by the Forestry Department is approximately 1:15.000 (DNTF, 2014). There is very limited capacity to detect potential infractions or infractions in the field in a timely enough manner to prevent infractions from happening. The current detection system operates principally at the level of checkpoints along the main roadways, but without any mechanisms to control the actual harvesting phase. This sub-optimal system also facilitates the petty corruption of local enforcement officials. This is exacerbated by a low capacity for response and

[11] It is important to note that a new definition of Forests was adopted in 2015, with these being defined as "An area of at least 1 hectare with a canopy coverage of 30% or greater, and tree height of above 5m.

[12] Available at: http://www.eia-international.org/wp-content/uploads/EIA-First-Class-Connections.pdf.

response effectiveness. Procedures for rapid response have not yet been developed, while sanctions and response from the juridical system upon reprehension are often not appropriate.

Fuelwood and charcoal (7% of total Emissions). The high demand through the informal markets for biomass energy in the urban areas has led to unsustainable exploitation of wood for charcoal in the rural areas. The annual consumption volume of fuelwood and charcoal is estimated at 14.8 million tons nationally, an amount that is even higher than the allowable cut volume for commercial wood. High demand for these sources is attributable to low purchasing power and a lack of viable energy sources in urban areas. The difficulty in verifying production and transport licenses for charcoal, and the local, informal channels established for the flow of the products makes regulation and control difficult.

These drivers are complex, often interacting each other and are difficult to separate. The model of deforestation and degradation in Mozambique occurs in sequence (Figure 3) where selective logging of high value species first takes places, opening up the forest to extraction of firewood and charcoal. Then, the area is converted into agricultural lands by small-scale farmers, accompanied by the construction of population settlements. This pattern of land use change often occurs in areas close to urban populations and roads, and where local governance of natural resources is not clearly defined. At the same time, other deforestation agents can act to modify this pattern of forest conversion. This interaction of multiple drivers acts in a cumulative manner over the long term, perpetuating the process of deforestation and degradation (Figure 3).

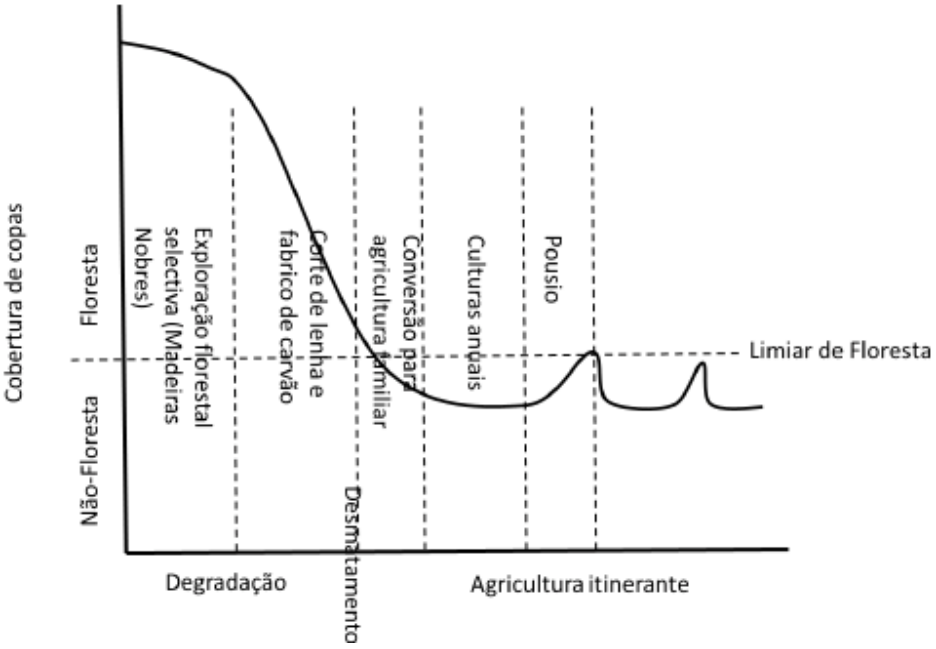


Figure 4 - The process of deforestation and degradation with the interaction of different factors.
Source: Winrock and CEAGRE, 2015

Land Tenure, Governance, and Impact on Forest Policies

An analysis of this aspect has been provided by the review of the legal framework conducted in the Readiness Fund context (Nemus / Beta, 2015), as well as by other analyses completed as part of the SESA and other documents. In the area of land tenure and governance, the main issues raised are: the lack of detailed knowledge of the legal instruments at the district and community level; law enforcement in the field has been hampered by a limited knowledge of legislation and procedures, a lack of human and material resources, low mobility of enforcement personnel in the provinces and districts; and issues of influence and corruption that still exist in the sector. Policies and

development plans in other sectors affecting forests (eg agriculture, energy and mines) have been considered in practice to be inconsistent with forest conservation and preservation and efforts should be made to align the implementation of these instruments with sustainable forest development. Although they negatively impact the forests, most of these sectors do not carry out activities of regeneration, management, conservation and preservation of the forests in the country. The mandates of the institutions that directly or indirectly affect forests were considered unclear in both provinces and sometimes contradictory and conflict with each other, especially at the level of provinces and districts. This situation is exacerbated by the limited knowledge of the mandates and procedures of these institutions, in the field of the Forest Law and Regulation and by the lack of or lack of functioning of the cooperation and coordination bodies at the provincial and district level.

The most important issue for the discussion on REDD+ in Mozambique is the need to harmonize the legal right to use and benefit from the land (DUAT) and the legal right to use and benefit from the forests. The DUAT does not confer to national holders and rural communities the right of access to forest resources except for subsistence purposes. The exploration of forest resources for economic purposes by communities, even within common areas, requires state authorization. The state also unilaterally decides on private-sector applications for forest concessions in community areas. The program will dedicate special attention to land planning, zoning and registration, as it is a crucial step towards improving territorial governance and implementing a landscape approach to reducing deforestation and promoting sustainable development.

A consulting company is currently preparing a study on land tenure assessment at a sub-national level, specifically focused on the Zambezia Landscape, which will consider specific issues raised by this review and fill in any gaps that require more detailed assessment. The objective is to assess how the country deals with the land tenure and land governance framework in the ER program context. The study also looks at the question of benefit sharing, with a focus on the link between land tenure issues and the development of an effective system that contributes to the ER objectives. The outputs of this study, while focused on the provincial level, will have implications and lessons learned at the national scale as well.

Relevant Documents for consultation:

Estratégia Nacional do REDD+ Novembro de 2016

Plano de Acção da Estratégia Nacional do REDD+ Novembro de 2016

Relatório Final do Estudo sobre Causas Directas e Indirectas do Desmatamento e Degradação Florestal

Relatório de Definição de Floresta V5 19.10.2016

Assessment

While some stakeholders classified this subcomponent as yellow, there was acknowledgement from these participants that they were not yet very familiar with the approved strategy and action plans, they were only approved in late November 2016 and this assessment was made in early January 2017. As a result, the Mozambique government believes that this thematic area is indeed green based on the quality of and detail contained in these documents.

At the same time it is recognized that these highly technical documents will need to be simplified in order to reach a wider audience, particularly those without higher levels of academic training.

3.4 Subcomponent 2b. Strategy Options

Selection of the Strategy Options

The final version of the National REDD+ Strategy was approved by the Council of Ministers on November 29th, 2016, along with the Action Plan for its implementation. The strategy incorporates the results produced by the four studies funded with this FCPF grant, namely (i) study of the causes of deforestation and degradation of forests and strategic options to contain this deforestation; (ii) national definition of "forests"; (iii) social and environmental strategic analysis; and (iv) analysis of the legal and institutional framework for the implementation of REDD+ in Mozambique.

The Strategy defines its overall objective as “Promoting integrated multisectoral interventions to reduce carbon emissions associated with land use and land use change through adherence to the principles of sustainable management of forest ecosystems (natural and planted) contributing in this way to global mitigation, climate change adaptation efforts, and integrated rural development.”

The Strategy uses a dynamic baseline for CO2 emissions, and sets out the goal of reducing those emissions by a total of 170 MtCO2 by 2030.

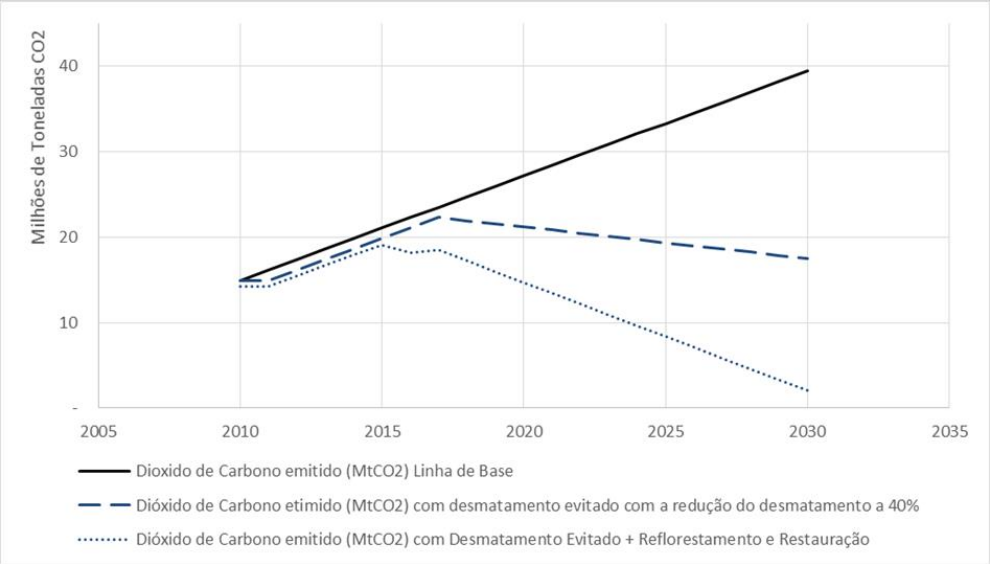


Figure 5 - Emission Reductions Potential

The strategic objectives have been defined as follows:

Objective 1 - **Inter-institutional coordination and transversal actions**: establish an institutional and legal platform for inter-institutional coordination that ensures the reduction of deforestation

Objective 2- **Agriculture**: promote sustainable alternative practices to shifting agriculture, which ensure increased productivity of subsistence and cash crops

Objective 3- **Energy**: increasing access to alternative sources of biomass in urban areas and increasing the efficiency of biomass energy production and use

Objective 4- **Areas of Conservation**: strengthen the conservation area system and find secure ways of generating income for it

Objective 5 - **Sustainable Forest Management**: promote the system of forest concessions, community management and strengthen forest governance

Objective 6- **Restoration of degraded forests and tree planting**: establish a favorable environment to increase planted area, forest business, restoration of natural forests and planting of trees for various purposes.

Along with this strategy, the MITADER has also approved a corresponding Action Plan for implementing the recommendations, the *Plano de Acção da Estratégia de REDD+ 2016* (MITADER, 2 November 2016).

Feasibility Assessment

While the National REDD+ Strategy has been assembled using the inputs obtained from all the relevant sectors and other stakeholders, the end product will still need to overcome substantial barriers in order to succeed. The national strategy highlights six key risks, as identified by the SESA:

(i) Weak adoption of alternative technologies in agriculture, tree planting and energy use;

(ii) Lack of clear mechanisms for compensation and recognition of forest carbon rights;

(iii) weak support of extension services;

(iv) Lack of inter-institutional coordination or lack of involvement of key actors to implement actions to reduce deforestation and forest degradation;

(v) Land conflicts and encroachment of rights over land; and

(vi) Lack of capacity of the institutions involved.

The Strategy takes into consideration these risks and identifies measures to confront them. Implementation of the strategy will require a series of actions by a variety of sectors. The Action Plan for implementation is a fifteen-year plan, divided into three 5-year periods.

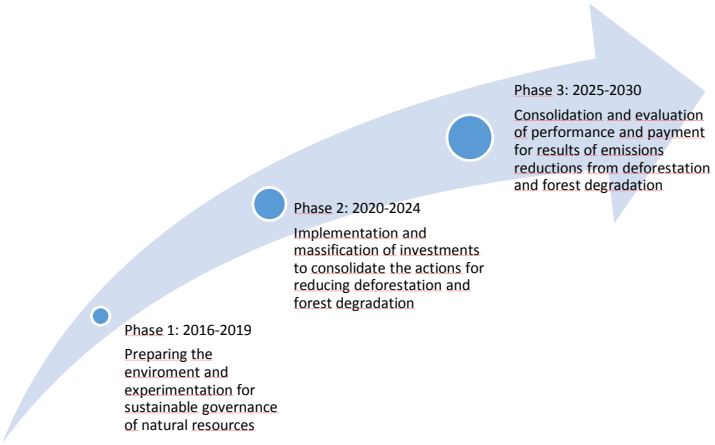


Figure 6 - Phases of the REDD+ Action Plan

Implications on Existing Sectoral Policies

The analysis of the legal and institutional framework (Nemus / Beta, 2015) shows that REDD+ provides added value, and can create opportunities to finance and promote processes identified as important for integrated development. The analysis of opportunities and risks of implementation of REDD + in Mozambique, carried out as part of the Strategic Environmental and Social Assessment (Scott Wilson, 2016), identified a number of opportunities, particularly within the current vision of integrated landscapes.

The success of REDD+ necessarily involves coordination and establishment of synergies between activities identified as potential for reducing deforestation and forest degradation and forest conservation. Aspects

such as the promotion of conservation agriculture, the use of commercial agriculture in areas with low forest cover, planting of trees for energy purposes, the production and efficient use of biomass energy, sustainable management of the forest concessions system, among others, are strategic REDD + actions which have already been proposed as strategic actions within their respective sectors.

Relevant Documents for consultation:

Estratégia Nacional do REDD+_Novembro de 2016

Plano de Acção da Estratégia Nacional do REDD+ Novembro de 2016

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements, and should be classified green.

3.5 Subcomponent 2c. Implementation Framework

Legal and Regulatory Framework

Mozambique has a progressive legal framework for the promotion of sustainable forest management. However, implementation of rules has had mixed success, indicating a need for review and assessment of the implicit and explicit incentives in the current system, as well as the costs and barriers associated with compliance. Increasing transparency and the equitable application of laws is also necessary to ensure that access to opportunities and distribution of benefits is seen as fair to all stakeholder groups.

The main legal instrument concerning REDD+ is the "Regulation of the procedures for the approval of projects for reducing emissions from deforestation and degradation" approved by Decree No. 70/13. The regulation of Decree No. 70/2013 highlights briefly the key components of the implementation mechanisms of the carbon rights, benefit sharing, REDD+ financing mechanisms and procedures for the approval of projects. By indication of this Decree other complementary legal instruments should be created, which have to date not been finalized. The restructuring of the Government of Mozambique in January 2015 culminating in the restructuring of several ministries and the creation of MITADER has led to a comprehensive movement for developing new legislation in the sector. This creates an opportunity to better incorporate the issues of REDD+ in forest legislation and better align the strategy of REDD+ with the legislation.

The Legal and regulatory framework of Mozambique for REDD+ has been the subject of a detailed analysis (Nemus / Beta, 2015), available for consultation at **Relatório Final do Estudo sobre o Quadro Legal e Institucional para o REDD+.** This analysis has also taken into consideration the needs for the implementation strategy of REDD+.

This aspect has also been analysed in the Strategy itself and the associated REDD+ Action Plan, where the first strategic objective focuses on the need to “establish an institutional and legal platform for inter-institutional coordination that ensures the reduction of deforestation,” and where the main barriers to implementation are outlined and measures defined to overcome them.

Benefit-Sharing Mechanism

The benefit sharing system is a fundamental aspect for the implementation of REDD+ initiatives successfully. This is already provided for in article 21 of the Decree No. 70/13 which states that the draft REDD+ should

always provide for the distribution of benefits, including local communities under the terms of ministerial diploma by all the Ministers who oversee the areas of the environment, agriculture and tourism.

A system of sharing of benefits is being prepared by a consultant (ETC Terra) for piloting in the Zambezia Landscape program, which could be then used as an example for scaling up for other projects/ nationwide.

However, the ministerial diploma on benefit sharing mechanisms should also be prepared in this phase of the REDD+ Readiness and must include aspects which ensure transparency in the sharing of benefits.

The Forest and Wildlife law of 1999 identifies the principles of local community participation in sustainable natural resources management in and outside protected areas. Among other aspect related with community participation and involvement it proposes that 20% of concession fees should go to local communities' resident in a concession area. Local Participatory Management Councils (COGEPs) constituted as associations with representation of all stakeholders with interests in the use of natural resources in each area are encouraged to be created as a mechanism for articulating and defending the interests of local communities and all relevant stakeholders. The mechanisms for channeling and utilizing the 20% of fees to benefit local communities was created in 2005 through Ministerial Diploma n.º 93/2005 of May 4th. However, there is also acknowledgement of the fact that the COGEPs have not always been effective mechanisms to collect and use the 20% by people living around the concessions, due both to lack of capacity at the community level and the lack of government ability to provide the necessary capacity-building.

The same law also stipulates that 50% of fines paid for forest infractions should be distributed amongst the persons involved in the apprehension of the infractor, including local community informants. This too has however been only infrequently implemented in practice.

National Registry and Monitoring System for Activities

On the other hand, the implementation of REDD+ projects requires due registration. Within the framework of REDD+ activities in Mozambique, the FCPF is supporting the creation of a MRV system which will include a National Registry. The REDD+ projects and the relevant information will be posted on this platform. Since the work on the registry has not been initiated, it was decided by the GoM to include its production as part of a new contact for Technical Assistance being negotiated with the FAO. This contract is expected to start in March 2017, and the registry finished by the end of the year. Once completed the platform in 2017, the public should also have access to certain information.

Currently, there is only an initial database of REDD+ Projects that was initiated by MICOA. FAO will be responsible for continuing and improving on this initial work while building the registry.

Relevant Documents for consultation:

Relatório Final do Estudo sobre o Quadro Legal e Institucional para o REDD+

Plano de Investimento do FIP

Estratégia Nacional do REDD+ Novembro de 2016

Plano de Acção da Estratégia Nacional do REDD+ Novembro de 2016

ESMF - Relatório do Quadro de Avaliação Ambiental e Social para Implementação do MozFIP, MozDGM e Iniciativas REDD+

Decree No. 70/2013 and Ministerial Diploma n.º 93/2005

ER-PIN - Letter of Intent – Zambezia Integrated Landscape Management Program

Letter of Intent – Zambezia Integrated Landscape Management Program

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen improvements, but that more work needs to be done on working out and formalizing the details for REDD+ program implementation (yellow).

3.6 Subcomponent 2d. Social and Environmental Impacts

Environmental and Social Assessment Process and Management Framework

Mozambique's REDD+ Program will trigger seven of the 10+2 World Bank Operational Safeguards Policies, namely, Environmental Assessment (OP/BP 4.01), Pest Management (OP 4.09), Involuntary Resettlement (OP/BP 4.12), Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Physical Cultural Resources (OP/BP 4.11) and pre-emptively Safety of Dams (OP/BP 4.37).

As part REDD+ Readiness process and with the FCPF support, three **safeguards instruments** were finalized in January 2017: a Social and Environmental Strategic Assessment (SESA), an Environmental and Social Management Framework (ESMF), and a Process Framework (PF). Of these, the ESMF and PF have been cleared by the Bank, and the SESA final draft was prepared and will be submitted to the bank clearance by March.

For close to two years, starting from 2015, an **extensive consultation process** was conducted to develop this set of instruments. The process covered six provinces, 44 Public Consultation meetings involving 1904 participants of which 664 were female. The process was used to explore issues around the drivers of deforestation and forest degradation, land use and land tenure, social and environmental protection and sustainable forest management.

The preparation of the ESMF

The ESMF is defined as a guide to the screening of the proposed Program interventions to ensure that they do not negatively affect the natural and social environment. This management instrument is particularly relevant in a situation where there is still an unclear definition of the program interventions, as is the case of this program at this stage. The preparation of the Environmental and Social Management Framework is considered the best management instrument for WB funded projects.

The ESMF outlines several principles, which include:

- A systematic procedure for participatory screening for project sites and subproject activities for environmental and social considerations;
- A step-by-step procedure for predicting the main potential environmental and social impacts of the planned project and subproject activities;
- A typical environmental and social management plan for addressing negative externalities during project/subproject implementation (planning, construction and operation);
- A step by step monitoring and evaluation system for implementation of mitigation measures; and
- An outline of recommended capacity building measures for environmental and social planning and monitoring of the subproject activities; and
- A budget to ensure that the Program has adequate resources to meet its own interests, especially financial resources for the preparation and implementation projects and subprojects ESIAs, ESMPs and RAPs.

The ESMF basic principles and requirements will be applied throughout the entire Program life cycle.

The ESMF will also ensure that a social and environmental screening process will help (i) determine which forest activities, infrastructure construction or rehabilitation and environmental restoration

activities, are likely to have potential negative environmental and/or social impacts; (ii) determine the level of environmental and social work required, including whether an ESIA/ESMP or a site specific ESMP will be required or not; (iii) determine appropriate mitigation measures for addressing adverse impacts; (iv) incorporate mitigation measures into the subprojects financed by MozFIP; (v) indicate the need for the preparation of a Resettlement Action Plan (RAP), which would be prepared in line with the Resettlement Policy Framework (RPF), prepared for the Project; (vi) facilitate the review and approval of the subproject proposals; and (vii) create, enhance or protect the same type of resources at another suitable and acceptable location, compensating for lost resources.

Safeguards implementation arrangements will build on the existing structure already in place at International Funds Management Unit under the FNDS.

Where relevant, site specific Environmental and Social Impacts Assessment (ESIA) with a costed Environmental and Social Management Plan (ESMP) or just an Environmental and Social Management Plans (ESMP) will be prepared so that the Project (i) avoids activities that could result in adverse environmental and social impacts on resources or areas considered as sensitive; (ii) prevents the occurrence of negative environmental and social impacts; (iii) prevents any future actions that might adversely affect environmental and social resources; (iv) limits or reduces the degree, extent, magnitude or duration of adverse impacts by scaling down, relocating, redesigning elements of the project; (v) repairs or enhances affected resources, such as natural habitats or water resources, particularly when previous developments have resulted in significant resource degradation; (vi) restores affected resources to an earlier (and possibly more stable and productive) state, typically 'background/pristine' condition; and (vii) creates, enhances or protects the same type of resources at another suitable and acceptable location, compensating for lost resources, including compensating people and other entities for any loss of assets and/or opportunities as defined under WB OP/BP 4.12 on Involuntary Resettlement.

Essential aspects of the Pest Management Plan (PMP) have been included in this ESMF and a Resettlement Policy Framework (RPF) has been prepared to be used along with the ESMF/PMP. They will all be reviewed and cleared by ASPEN and then publicly disclosed both in-country and at the InfoShop prior to project appraisal.

The project is not expected to have significant resettlement implications going beyond economic losses, nonetheless RPF will also ensure that involuntary resettlement is avoided where feasible, or minimized, exploring all viable alternative project designs. Where it will not be feasible to avoid resettlement, a Resettlement Action Plan (RAP) will be prepared and disclosed accordingly.

The preparation of the SESA

The preparation of safeguards instruments in the country is considered as a multisectoral initiative involving different stakeholders from communities, private sector and government. Social environmental safeguards are expected to be a benchmark for different REDD + initiatives in the country.

The preparation process involved consultation at the national, provincial and community levels on REDD + initiatives, sustainable forest management and risks in the implementation of REDD + initiatives.

The preparation of the instruments took into account the 2010 Cancun decisions on environmental and social safeguards for REDD + implementation. During the preparation of the instruments, the World Bank's safeguards policies, the national legal framework and international conventions to which Mozambique is a signatory have been taken into account.

The basic document in the instrument preparation process was the National Forest Investment Plan, the ESAF approved by the Regional Safeguard Advisor (RSA) was developed to meet the objectives of the Forest Investment Project in the country and the different REDD + initiatives;

SESA is in the final stage of preparation, in a process of review and inclusion of comments from different stakeholders.

REDD+ strategy design with respect to impacts

The SESA consultation processes were carried out in coordination with the development process of the national REDD+ Strategy, leading to a high degree of integration of the concerns raised into the final version of the strategy. Specific consultations were held jointly to ensure input and comments from different groups in the elaboration of the national strategy. Regular meetings with the preparation groups were also considered. The strategic options defined for reducing deforestation and forest degradation are all taking into account the risks associated with the development of REDD + initiatives.

For example, one of the regular themes brought up in the provincial consultations was the political risk associated with ingrained corruption and impunity within the timber sector. As a result, specific actions to address this have been included in the REDD Strategy Action plan, such as: Supporting the separation of Timber Licensing from Law Enforcement; the development of a transparent Forest Information System; support to the development of a new Law Enforcement Strategy for AQUA, and linking the emission of harvest licenses to the performance of operators on an regular evaluation carried out in a participatory manner involving not only government officials but also civil society. Financing for these actions will be been sourced from the FIP, ensuring resources are available to meet these priorities.

A detailed list of all the consultations is found in annex to this document.

Relevant Documents for consultation:

Relatório Final do Estudo sobre o Quadro Legal e Institucional para o REDD+

Quadro de Gestão Ambiental e Social para o REDD+ em Moçambique

Relatório da Avaliação Ambiental e Social Estratégica para o REDD+ em Moçambique

Quadro de Política de Reassentamento para o REDD+ em Moçambique

Relatório sobre Envolvimento dos Actores-chave no Processo de Elaboração do SESA para o REDD+

Resumo das Consultas Públicas

Planilha das Consultas Públicas

ESMF - Relatório do Quadro de Avaliação Ambiental e Social para Implementação do MozFIP, MozDGM e Iniciativas REDD+

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements and is REDD+ Ready (green). The latest documents demonstrate the relationship between the SESA and the REDD + Strategy.

3.7 Component 3: Reference Emissions Level/ Reference Level

Rationale

Mozambique is developing, with the support of the FCPF, a Forest Reference Emission Level /Forest Reference Level (FREL/FRL) and a Monitoring Systems for Forests (M); establishing and operationalizing a Measuring, Reporting and Verification (MRV) System and providing goods for the development of a National Activity Data (AD) Analysis (Land Use Land Cover Changes Analysis) and a National Forest Inventory.

The National MRV Road Map, where the main M&MRV activities are planned, was drafted and dynamically adapted throughout 2016 (see MRV Road Map & Presentation, where components 3 and 4 of this R-package are described in detail).

On November 29th, 2016, the Government of Mozambique, via the Council of Ministers, approved the National Strategy (+ the Action Plan) for reducing emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks (REDD +). In section 7 of this National Strategy, the M&MRV component is described in general terms, aligned with the roadmap mentioned above. The Monitoring, Measurement, Reporting and Verification (M & MRV) procedures of the REDD + activities will be transparent and robust, as envisaged by the United Nations Framework Convention on Climate Change (UNFCCC) and are methodologically based on the most recent guidelines from the Intergovernmental Panel on Climate Change (IPCC).

It is explicitly referred to in this National Strategy that the standards, procedures and guidelines for monitoring and measuring REDD + activities and results in Mozambique should be prepared in light of the strategic objective to ensure the active participation of local communities (participatory or community-based MRV; PMRV). It should also include useful information for the definition of environmental indicators related to the reduction of deforestation and forest degradation and related emissions, economic and social indicators linked to integrated rural development, as well as specific indicators on environmental and social safeguards, as set out in the Environmental and Social Management Framework (ESMF) of REDD+.

The Forest Reference Emission Level (FREL) and Forest Reference Level (FRL) (both expressed in tonnes of carbon dioxide equivalent) are benchmarks for assessing country's performance in implementing REDD+ activities. FREL is the amount of gross emissions from a geographical area estimated within a reference time period and it is used to demonstrate emission reduction from avoided deforestation and forest degradation, while FRL is the amount of net/gross emission and removals from a geographical area estimated within a reference time period and it is used to demonstrate emission reduction from conservation, sustainable forest, management and enhancement of carbon stocks.

Mozambique is developing during 2017 a National Forest Reference Emission Level (FREL) /Forest Reference Level (RL) based on a step-wise approach. This baseline will be reported to the United Nations Framework Convention on Climate Change by December 2017, following the FCPF MF requirements to ensure consistency between national and subnational FREL/FRLs. It will incorporate, in different versions throughout 2017, the results of the AD analysis at the national level and the emission factors calculated through the implementation of the National Forest Inventory, and also integrate a preliminary sub-national FREL/FRL developed in Zambézia Province (the ER-PIN for the Zambézia program was accepted in the FCPF Carbon Fund pipeline, and an ERPD is being prepared).

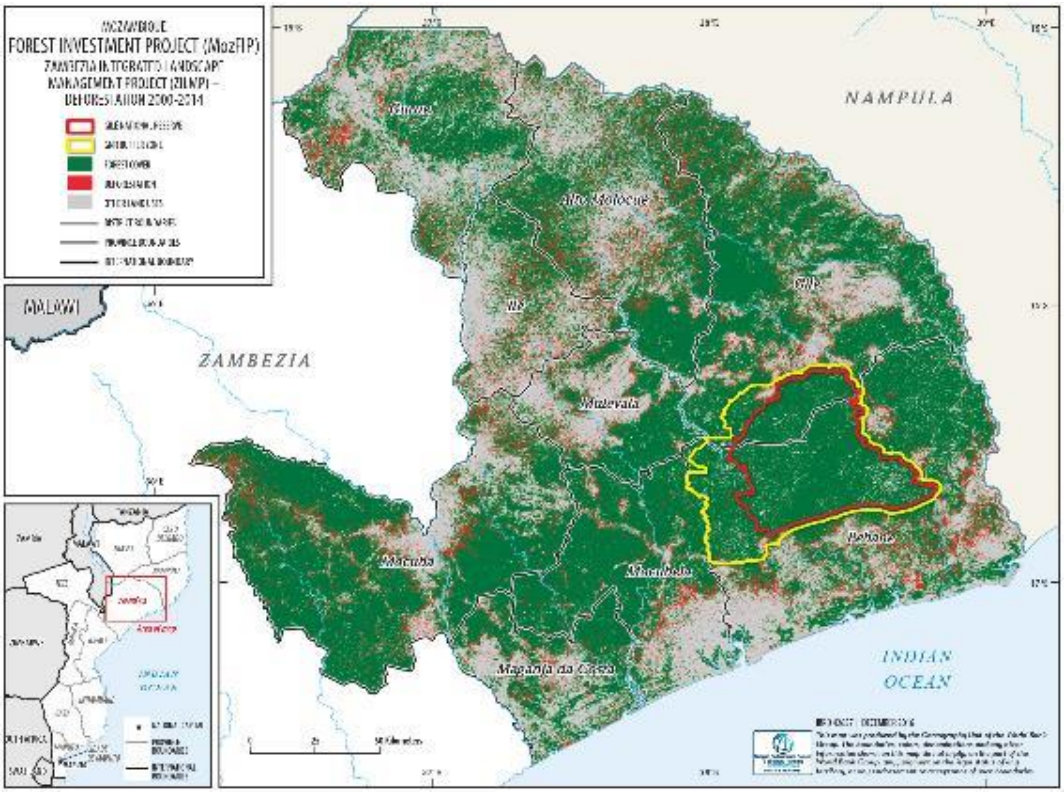


Figure 7 - Zambezia Integrated Landscape

Main design elements

Scope

The scope of the FREL/FRL (Geographic boundaries, Forest Definition, and REDD+ Activities) is consistent with the scope of the monitoring system.

Geographic boundaries

The FREL/FRL is being calculated at national level with specific program or project's FREL/FRL estimated from the national one using a stratified approach by vegetation types. The national broad geographical boundary is reduced depending on the selected REDD+ activities (deforestation, forest degradation and forest enhancement). The two first activities will only take forested areas into account; deforestation can only occur on lands that are forest and are converted to non-forest and degradation can only occur on lands that are forests and remain as forests. For forest enhancement monitoring purposes the focus can be on forest and non-forest land (A/R activities).

According to the results of the project of Mozambican Agro-ecological Zoning ('Zoneamento Agroecológico de Moçambique', ZAEN, 2010-2014) based on the interpretation and verification of Landsat images from 2009-2010, the area occupied by Semi-natural terrestrial vegetation is 62,575,825 ha, by Semi-natural aquatic vegetation 2,389,959 ha and by Cultivated and managed terrestrial areas (only forest plantations) 11,864 ha. If we focused on tree based ecosystems (mainly forests and woodlands) the total survey area sets to 45,503,861 ha; 539,814 ha of Semi-natural aquatic vegetation, 44,952,183 ha of Semi-natural terrestrial vegetation and 11,864 ha of forest plantations.

Forest definition

Mozambique submitted a forest definition to the UNFCCC for CDM AR activities[13], which in October 2016[14] was submitted to the Council of Ministers as the approved proposal for Forests, Deforestation and Forest Degradation Definitions under REDD+.

As a result of a detailed analysis and a participatory process, the forest definition was expressed as follows: '*Forest are lands that occupy at least **1 ha** with **canopy cover> 30%**, and with trees with potential to reach a **height of 3 meters** at maturity, temporarily cleared forest areas and areas where the continuity of land use would exceed the thresholds of the definition of forest, or trees capable of reaching these limits in situ*'.

REDD+ Activities

According to Centro de Estudos de Agricultura e Gestão de Recursos Naturais (CEAGRE) & WinRock International (2016)[15] the main drivers of deforestation and forest degradation (usually occurring in a combined or sequential manner) in Mozambique are linked to Shifting cultivation (89,407 ha/year and 7.8 MtC/year, 65%), followed by Urban Expansion (16,285 ha/year, 1.4 MtC/year, 12%). Other relevant drivers were identified as logging and firewood and charcoal, and livestock grazing. Commercial (large-scale) agriculture and mining become of great relevance at local level. On the other hand, analysis has shown that forest degradation (including selective logging, firewood and charcoal and fires) plays a very important role in emissions accounting for up to 30% of total emissions.

'**Reducing Emissions from Deforestation'** and '**Reducing Emissions from Forest Degradation'** are both, according to the previous analyses, significant. Accounting for both ensure that there are no leakage emissions from displacements of deforestation drivers that could cause an increase in emissions from degradation. FCPF CF MF requires selecting deforestation and degradation if it represents more than 10% of total forest-related emissions. Additionally, there is an interest to account for '**Enhancement of forest carbon stocks**' (ECS), but limited to afforestation/reforestation (A/R) activities. Potential GHG removals or emissions from 'Conservation of Forest Carbon Stocks' and 'Sustainable Management of Forests', are expected to be insignificant compared with the above mentioned.

Scope Summary

Scope	Definition
Geographical boundaries	Mozambique national boundaries (it depends on the REDD+ activity).
Forest definition	MMU 1.0 ha / CC 30 % / TH 3 m
REDD+ activities	▪ Reducing emissions from deforestation, ▪ Reducing emissions from forest degradation, ▪ Enhancement of forest carbon stocks (Afforestation/Reforestation)

Table 6 -Summary of Scope specifications

[13] http://cdm.unfccc.int/DNA/index.html. *A single minimum tree crown cover value of a 30 per cent, a single minimum land area value of 1 hectare and a single minimum tree height value of 5 metres.*

[14] Definição de Florestas, Desmatamento e Degradação Florestal no âmbito do REDD+. Outubro, 2016. Mário Paulo Falcão e Micas Noa para o FNDS. http://www.redd.org.mz/uploads/SaibaMais/ConsultasPublicas/Relatorio%20definicao%20de%20floresta%20V5_19.10.2016.pdf

[15] Identificação e análise dos agentes e causas directas e indirectas de desmatamento e degradação florestal em Moçambique. Relatório final. Abril, 2016. Centro de Estudos de Agricultura e Gestão de Recursos Naturais (CEAGRE) & WinRock International.

Methods

Methods depend on the REDD+ activities and pools being monitored and measured, that must be defined.

Definitions

Deforestation and Forest Degradation - Under Decision 16/CMP.1, UNFCCC defined deforestation as: '... the direct, human-induced conversion of forested land to non-forested land'. Effectively this definition means a reduction in crown cover from above the threshold for forest definition (30%) to below this threshold. Non-forest land converted to forest land would generally be referred to as 'afforestation' and is reflected in new forest area being created.

Forest degradation (and enhancement of carbon stocks; the opposite trend and definition) within forest land, occurs in forest areas where there are anthropogenic net emissions (i.e. where GHG emissions are larger than removals), during a given time period (no longer than the commitment period of the accounting framework) with a resulting decrease in canopy cover/biomass density that does not qualify as deforestation. A net increase, at national or subnational scale, in this category would refer to the 'enhancement of carbon stocks'. Developing a FREL/FRL and a monitoring system for degradation involves identifying the causes of degradation, and assessing the likely impact on the carbon stocks: **selective logging** (both legal and illegal), **forest fires,** over exploitation for **fuel wood** and **animal grazing**.

In October, 2016, the approved proposal of Forests, Deforestation and Forest Degradation Definitions under REDD+ was submitted to the Council of Ministers. As a result of a detailed analysis and a participatory process, deforestation and forest degradation were expressed as follows: **Deforestation** *is the conversion, directly induced by man, of land with forest to land without forest (it will be considered the national forest definition: a reduction in canopy cover from above the threshold for forest definition, 30% to below this threshold)*; and **Forest degradation** *is the long-term reduction of canopy cover and/or carbon stock that leads to a reduction in the provision of benefits from the forest, which includes timber, bio-diversity and other products and services. This reduction is through logging, burning, cyclones and others, provided that canopy cover remains above 30%.*

General method for estimating CO2 emissions and removals

The IPCC Guidelines refers to two basic inputs to calculate as a product the greenhouse gases emissions and removals: activity data and emissions/carbon-stock-change factors. Activity data refers to the extent of a category (areal extent of deforestation, forestation and forest degradation/ enhancements). Emission factors refer to emissions/removals of greenhouse gases per unit area (in metric tons of carbon per hectare) resulting from land-use conversions and the consequent carbon stock changes.

Activity Data

'Activity data' refers to the extent of a category, and in the case of deforestation, forestation and forest degradation/enhancements refers to the area of those categories, presented in hectares. Practically speaking activity data is therefore referred to as area data.

Approaches

We consider a spatially explicit tracking of land-use conversions over time (third approach) as the most appropriate to understand the drivers of deforestation and forest degradation and plan adequate mitigation activities. It is in fact required for measuring deforestation by the FCPF CF MF, and the selected approach at National Level.

Approach 3 considers two different options for obtaining the activity data: a) wall-to wall mapping or b) sampling. It has been repeatedly demonstrated that a well-designed sampling approach to train a supervised classification of changes on a multi-temporal stack of images provides more accurate results than

a comparison of two time-static LULC maps, even when these maps are very detailed. The result of this sampling approach could be also a change map, that while not exactly an updated version of a LULC map, ideally should show a good degree of agreement. Considering the historical analysis necessary to produce the FREL it is clear that it does not make sense to prepare historical LULC maps, but rather to monitor the future implementation of the mitigation activities and their impact (and for other purposes as NFI design, forest management, etc.) and then to elaborate updated versions of the LULC maps (update methodology must be simple but accurate and consistent with the analysis of changes). Both methods are acceptable by the FCPF CF MF. This mixed approach has been selected at the national level to monitor and measure AD. In other jurisdictional programs and projects, in order to ensure consistency with the national level, a similar decision should be taken in this regard. It is necessary to rely on the national level data for the historical analysis (top-down approach to apply a FREL based on vegetation type stratification) but more detailed information could be prepared at local level (bottom-up perspective) to train a change detection mosaic under a sampling approach methodology or to produce an updated version of a LULC map.

Sentinel-2 imagery is being used to produce the **benchmark map** (it will be finalized in March, 2017) necessary to complete the historical AD analysis and as a starting point for MRV purposes. The MRV Unit at FNDS (Fundo Nacional de Desenvolvimento Sustentável) is preparing this LULC 2016 map based on Sentinel-2 products. For this purpose 4 national mosaics (2 epochs / 2 spectral resolutions and 2 spatial resolutions 10 m/20 m) have been prepared (see Sentinel2 Mosaics). The first mosaic covers the entire area of Mozambique with Sentinel-2 A images **dated May-June 2016**. The second mosaic is meant to support the classification of (semi-) Deciduous formations. In view of the fact that Dry Miombo loses its leaves in July-August, and that Wet Miombo does so in August – September, it was decided to select the **August-September** reference period to image deciduous trees with no leaves, and in this way improve the classification result.

By using Sentinel-2 for MRV purposes (LULC map 2016 and LULC changes monitoring) we could achieve, due to its spatial resolution (10m/20m) and its absolute geolocation uncertainty: 20 m at 2σ confidence level without Ground Control Points and 12.5 m 2σ with GCPs (absolute geolocation < 11 m at 95.5% confidence, baseline 02.04, 08/12/2016), a MMU of approx. 1,000 m^2 (10,000 m^2 is the required MMU).

For the historical analysis of AD, the entire area of the country is being visually assessed (Inhambane and Zambézia provinces have been evaluated to date) on a 4 x 4 km grid at national level (the same grid used to allocate the NFI clusters from the Stratified Random Sampling design) using high and medium resolution imagery. The spatial assessment unit is almost the equivalent a 3 x 3 block of Landsat pixels (100 x 100 m), where a plot of same dimensions and an internal grid of 5 x 5 points is overlapped. This precise set of data which characterizes the current LULC and the changes produced in the historical series, will be used to decide the training areas for the LULC 2016 (sentinel-2) and for the image stack of Landsat 8 OLI and Landsat 5 TM (historical AD analysis); training subset (70%). A subset of data will be used for validation purposes of both products; test subset (30%) (see AD Accuracy Assessment).

Landsat 8[16] spatial resolution is 30 meters for VNIR and 15 meters for panchromatic. By using this product and Landsat 5 TM for historical AD analysis we could achieve, due to its geometrical accuracy of 1 pixel (30m)[17], a MMU of 3 x 3 pixels = 90 m x 90 m = 0.81 ha, lower than the 1 ha MMU. It is highly recommended (2015 GOFC-GOLD REDD Sourcebook) to use for the historical analysis the Global Land Survey (GLS) collection of Landsat imagery, orthorectified and cloud free images/composites, of 2005 and 2010 (combination of Landsat TM and ETM+ data).. This MMU definition is fully compatible with FCPF CF MF (it does not specify any requirement on this regard).

[16] The Landsat 8 satellite payload consists of two science instruments—the Operational Land Imager (OLI) and the Thermal Infrared Sensor (TIRS). These two sensors provide seasonal coverage of the global landmass at a spatial resolution of 30 meters (visible, NIR, SWIR); 100 meters (thermal); and 15 meters (panchromatic).

[17] Because of this constraint we should consider a positional accuracy of any geo-info product better (or equal) than 30 m.

In addition SAR (Synthetic Aperture Radar) data, specifically Phased Array type L-band Synthetic Aperture Radar (PALSAR is an active microwave sensor using L-band frequency to achieve cloud-free and day-and-night land observation) from ALOS (2006, Advanced Land Observing Satellite – JAXA - Japan Aerospace Exploration Agency) and from the new ALOS-2 (launched in 2014) would provide useful and complementary information for specific vegetation types and activities (forest degradation). JAXA, has produced the 4 year-25m spacing global PALSAR mosaics, that Advanced Land Observing Satellite (ALOS)/ Phased array Type L-band SAR (PALSAR) collected globally from 2007 to 2010 using the accurate SAR processing, and the same product for 2015 (ALOS-2). These products are free available from:

http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/data/index.htm.

One unit data contains PALSAR HH, HV backscatter, forest/non-forest map, local incidence angle, mask info (layover, shadowing, ocean flag, effective flag, void flag) and total dates from the launch. SAR backscatter data is slope corrected and ortho-rectified using the SRTM3, and radiometrically calibrated.

Classification system

The classification system, consistent with the national FREL and the GHG inventory, is composed of non-overlapping LULC classes and forest strata, with an independent class for forest systems where cyclical changes in forest cover are present.

National LULC classes (level 2) and national subclasses (level 3) and their correspondence with the IPCC classes (level 1) are shown in the following table.

Level1 IPCC		Level2 National Classification		Level 3 National Classification	
1	Cropland	1TCF	Tree crops	1TCF	Tree crops
		1FC	Field crops	1FC	Field crops
				1SCT	Shrub Plantation (Tea)
				1FCR	Rainfed field crops
				1FCI	Irrigated field crops
				3AC	Rice crop
		1CXF	Shifting cultivation with open to closed forested areas	1CXF	Shifting cultivation with open to closed forested areas
2	Forest Land	1TCW	Forest Plantation	1TCW	Forest Plantation
		2FXC	Forest with shifting cultivation	2FXC	Forest with shifting cultivation
		2FE	Broadleaved (Semi-) evergreen closed forest	2FE	Broadleaved (Semi-) evergreen closed forest
				2DEC	Coastal dense woody vegetation
				4FF	Mangrove dense
				2FEA	Mecrusse dense
				2FEG	Gallery forest
				2FEM	Closed broadleaved (Semi-) evergreen mountaineous forest
		2FD	Broadleaved (Semi-) deciduous closed forest	2FD	Broadleaved (Semi-) deciduous closed forest
				2FDB	Miombo dense
				2FDC	Mopane dense
		2WE	Broadleaved (Semi-) evergreen open forest	2WE	Broadleaved (Semi-) evergreen open forest
				2DEO	Coastal open woody vegetation
				4WF	Mangrove open
				2WEA	Mecrusse open
				2WEM	Open broadleaved (Semi-) evergreen mountaineous forest
		2WD	Broadleaved (Semi-) deciduous open forest	2WD	Broadleaved (Semi-) deciduous open forest
				2WDC	Mopane open

Level1 IPCC		Level2 National Classification		Level 3 National Classification	
				2WDB	Miombo open
3	Grassland	2GL	Grasslands	2GL	Grasslands
		2T	Thicket	2T	Thicket
				2TE	Broadleaved (Semi-) evergreen thicket
				2TD	Broadleaved (Semi-) deciduous thicket
		2S	Shrubland	2S	Shrubland
				2SE	Broadleaved (Semi-) evergreen shrubland
				2SD	Broadleaved (Semi-) deciduous shrubland
4	Wetlands	4SF	Aquatic or regularly flooded shrublands	4SF	Aquatic or regularly flooded shrublands
		4HF	Aquatic or regularly flooded herbaceous vegetation	4HF	Aquatic or regularly flooded herbaceous vegetation
		7WB	Artificial water bodies	7WB	Artificial water bodies
		8WB	Natural water bodies	8WB	Natural water bodies
		17	Salt lake	17	Salt lake
5	Settlements	5	Settlements	5	Settlements
6	Other Land	6BS	Bare soils	6BS	Bare soils
		6BR	Bare rocks	6BR	Bare rocks
		6SS	Dunes	6SS	Dunes

Table 7 - LULC Classification system in Mozambique.

The National Classification presented here matches the National (level 2) and Provincial classes (level 3) of the 'Integrated Assessment of Mozambican Forests' (AIFM 2007, Mazorli, A., Rural Consult Lda., Agriconsulting, Cooperazione Italiana) and the LULC classes (level 3) of the 'Zoneamiento Agroecológico de Moçambique' (ZAEN, 2010-2014). Provincial Forest Inventories conducted by JICA (Japan International Cooperation Agency) in Gaza and Cabo Delgado (2015-2016) and the current National Forest Inventory (2016-2017) use strata that are sets of classes previously detailed.

For REDD+ purposes, non-forest classes could be aggregated as long as conservative estimates would be used for the whole non-forest class, but disaggregation is a requirement of the 2006 IPCC GL for reporting purposes. Thus, as a first approach, we can consider a sole non-forest class (bringing together Grassland, Cropland, Settlement, Wetland, and Other Land) to estimate EFs (see next chapter) but for the proper performance of the PMRV, also non-forest classes should be disaggregated following National and IPCC classifications.

Temporal boundaries

FCPF CF MF requires that the historical periods have a length of about 10 to 15 years (with justification) (indicator 11.2), ending with the most recent date prior to two years before the TAP starts the independent assessment of the draft ER Program Document and for which forest-cover data is available to enable IPCC Approach 3 (exceptions allowed with convincing justification (indicator 11.1). It is expected that the TAP technical assessment of the ER-PD in Mozambique will start in 2017, and therefore the period of historical analysis could be extended until 2015. Given that the first Sentinel-2 images date from December of 2015 in Mozambique and first images that meet the quality requirements necessary for the elaboration of a LULC map are from 2016 (most recent date for which forest-cover data is available to enable IPCC Approach 3) we consider to extend the historical period until 2016.

The historical period that was consider in our analysis is 2001-2016, although it could be restricted to the period 2006-2016 if necessary.

Accuracy Assessment

The accuracy of the LULC map 2016 (based on sentinel-2 imagery) that is being elaborated by the MRV-Unit (FNDS) will be finalized based on independent reference data, applying statistical sampling to measure overall accuracy, errors of omission and commission for each class. An accuracy assessment exercise will also be implemented for the LULC changes map (AD), to estimate confidence intervals of each LULC change class (Olofsson et al., 2014[18]). FCPF CF MF requires an estimate of uncertainty of activity data using accepted international standards, and to propagate these in order to estimate uncertainty of emission reductions using Monte Carlo methods in order to report uncertainty with a two-tailed 90% confidence interval. The complete methodological proposal to quantify uncertainty and errors and to estimate LULC changes areas can be found in the AD Accuracy Assessment).

AD Summary

Activity Data	Definition
Approach	▪ 3.Spatially explicit tracking of land-use conversions over time, with a well-designed sampling approach (4 x 4 km grid) to train a supervised classification of changes on a multi-temporal stack of Landsat Imagery (historical AD) or Sentinel-2 Imagery (M&MRV purposes). ▪ EOS: Sentinel-2 (spatial resolution 10 m VNIR, 20 m Red Edge & SWIR/60 m SWIR & others), Landsat 8 OLI (spatial resolution 30 m VNIR, 15 m - panchromatic) and Landsat 5 TM in combination with other high resolution imagery and SAR (Synthetic Aperture Radar) data (e.g. PALSAR from ALOS/ALOS2). ▪ Positional accuracy of any geo-info product better (or equal) than 30 m. (11 m Sentinel-2, 30 m Landsat)
Classification System	Consistency: 2006 IPCC categories, National Classification in 'Integrated Assessment of Mozambican Forests' (AIFM 2007, Mazorli, A., Rural Consult Lda., Agriconsulting, Cooperazione Italiana), 'Zoneamiento Agroecológico de Moçambique' (ZAEN, 2010-2014), Provincial Forest Inventories conducted by JICA (Japan International Cooperation Agency) in Gaza and Cabo Delgado (2015-2016) and National Forest Inventory (2016-2017). Table 4.
Temporal boundaries	▪ Historical period of the FRL covering of 10-15 years ending 2016. Three historical epochs before 2016 and not beyond 2001 with a separation of at least 2 years between epochs. ▪ Benchmark map of 2016 will be required for monitoring purposes (Sentinel-2).
Accuracy Assessment	Accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two-tailed 90% confidence intervals of each category (Olofsson et al., 2014).

Table 8 - Summary of AD specifications.

Emission Factors

'Emission factors' refers to emissions/removals of greenhouse gases per unit area, e.g. tons carbon dioxide emitted per hectare of deforestation. Emissions/removals resulting from landuse conversion are manifested in changes in ecosystem carbon stocks, and for consistency with the IPCC Guidelines, we use units of carbon,

[18] Pontus Olofsson, Giles M. Foody, Martin Herold, Stephen V. Stehman, Curtis E. Woodcock, Michael A. Wulder, Good practices for estimating area and assessing accuracy of land change, Remote Sensing of Environment, Volume 148, 25 May 2014, Pages 42-57, ISSN 0034-4257, http://dx.doi.org/10.1016/j.rse.2014.02.015.

specifically metric tons of carbon per hectare (t C ha^{-1}), to express carbon-stock-change factors for deforestation and forest degradation[19].

Approaches

We consider the third approach (tier 3) as the most desirable, conducting a detailed national inventory of key C stocks, with repeated measurements of key stocks through time and modelling, in order to accurately estimate carbon stock changes due to selected REDD+ activities.

The 2006 IPCC GL recommends prioritizing resources in significant pools by reaching Tier 2 (Preparing country specific data for key factors, e.g. using secondary sources of related information), whereas using conservative estimates at Tier 1 for non-significant pools, but FCPF CF MF requires at least Tier 2 for monitoring.

Currently, there are two ongoing projects that are expected to be completed in 2018 and to generate the necessary information to produce the EFs estimations under Tier 3: the National Forest Inventory and the Establishment of a National Net of Permanent Plots to estimate repeatedly over time key C stocks.

National Forest Inventory (2016-2017)

The overall aim is establishing a National Forest Monitoring System (NFMS) for the country to support decision-making on sustainable forest management with scientific evidence and also the development of a sustainable forest policy at national level. The FMS will periodically collect complete, accurate and updated information on forest status (10 years). One of its specific objectives is to estimate the carbon content for aboveground and below ground biomass, dead organic matter (litter and dead wood) and soil pools by vegetation type/ land use.

The NFI is being coordinated by the Direcção Nacional de Florestas (Ministério da Terra, Ambiente e Desenvolvimento Rural, MITADER), and implemented by Serviços Provinciais de Florestas e Fauna Bravia (MITADER), Department of Natural Resources Inventory (DIRN), IIAM and UT-REDD+ (MRV Unit, FNDS), and with the support of other collaborating Institutions (Eduardo Mondlane University).

The target area of this NFI is the entire terrestrial territory of Mozambique, but specifically it focuses on natural and semi-natural forest systems (Table 4. Strata characterization and number of clusters).

With the results from the NFI we will be able to calculate by the end of 2017 the carbon content for aboveground (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC) by vegetation type/ land use, and the corresponding EFs. All methodological aspects regarding the NFI are explained in detail in the NFI Guidelines.

[19] 'Carbon dioxide equivalent' or 'CO_2e' is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. Global Warming Potential (GWP): (i) Carbon dioxide (CO_2) = 1, (ii) Methane (CH_4) = 25, (iii) Nitrous oxide (N_2O) = 298, (iv) Hydrofluorocarbons (HFCs) = 124 – 14,800, (v) Perfluorocarbons (PFCs) = 7,390 – 12,200, (vi) Sulfur hexafluoride (SF_6) = 22,800, (vii) Nitrogen trifluoride (NF_3)[3] = 17,200.

A quantity of CO_2 can be expressed in terms of the amount of carbon it contains by multiplying the amount of CO_2 by 0.27 (12/44, ratio of C atomic weight and CO_2 molecular weight).

N	Strata	Area (ha)	N/ha	AB/ha	Vt/ha	Cv	nº clusters
1	Semi-deciduous dense forest (+Miombo dense)	7,547,903	88.2	6.4	60.9	57.0	**127**
2	Mopane	2,183,139	77.4	2.8	20.9	50.0	**98**
3	Semi-evergreen forest (+Gallery Forest)	1,662,652	91.0	5.2	47.9	50.0	**97**
4	Mecrusse	526,349	58.5	3.1	26.3	40.6	**66**
5	Semi-evergreen mountainous forest	884,858	58.3	4.0	39.2	38.4	**59**
6	Semi-deciduous open forest (+Miombo open + Tree savanna)	29,725,985	81.9	4.3	33.3	71.9	**91**
7	Semi-evergreen open forest	2,421,296	73.6	3.4	24.8	68.3	**82**
	Total	**44,952,183**					**620**

Table 9 - Strata characterization and number of clusters.

10% more clusters were added as a reserve in case of no accessibility.

NFI started its implementation in July 2016 and three provinces (Maputo, Nampula and Inhambane) have been surveyed so far (besides the two provincial forest inventories in Gaza and Cabo Delgado provinces, projects funded by JICA).

Establishment of a National Net of Permanent Plots (2018)

Despite the relevance of native forests in Mozambique, knowledge about their species composition, structure, and dynamic is still limited, which makes it difficult to elaborate sustainable management plans.

UT-REDD+ (MRV Unit) in close collaboration with IIAM and UEM has planned to establish a net of permanent plots in key ecosystems in Mozambique to deepen the knowledge of species composition, structure, dynamic, and specifically to serve as a basis of the MRV system allowing estimate repeatedly over time key C stocks and EFs.

It is intended to add 60 permanent plots to the existing 36 and complete the representativeness of the different vegetation types. In table 5 permanent plots' distribution by vegetation types in forest ecosystems in Mozambique is summarized.

The net of permanent plots should be remeasured every two years to report differences in carbon stocks and EFs (48 plots are measured per year). It is a sustainable proposal on which we can base the EFs' updating process (Tier 3), rather than on the National Forest Inventory that should be updated every 10 years.

Vegetation types	Existing variables	Additional variables	Permanent plots that already exits	New permanent plots
Floresta sempre verde	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	5	10
Floresta sempre verde de montanha	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	0	12
Floresta semi decídua	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	0	12
Miombo	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	19	3
Mopane	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	9	6

Vegetation types	Existing variables	Additional variables	Permanent plots that already exits	New permanent plots
Mecrusse	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	3	7
Mangal	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	0	10
Galeria	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	0	0
Savana	DBH, Ht, Hcomercial, quality, health status and altitude	Aboveground biomass (AGB) and below ground biomass (BGB), dead organic matter (litter and dead wood) (DOM) and soil pools (SOC), EFs	0	0
Total			**36**	**60**
Grand Total				**96**

Table 10 - Permanent plots by vegetation types in Mozambique.

Mozambique intends to test a new sustainable and accurate methodology for monitoring permanent plots after establishment in 2018 based on the restitution of pairs of hemispherical photographs.

The stereoscopic hemispherical images are a cost-efficient technique to obtain detailed information on diameter distribution and species composition that can be used complementarily to remote sensing in a double sampling scheme.

Carbon Pools

A carbon pool is considered significant, and therefore should be measured following IPCC guidance, if it represents >20% of the total emissions of its category (Chapter 1 of 2006 IPCC GL Volume 4). However, FCPF CF MF requires accounting significant carbon pools as those potentially responsible of above 10% of the total emissions, and allow excluding carbon pools that would underestimate emission reductions (i.e. conservative principle). These requirements refer to 10% of total emissions (combining EFs with AD) while the 2006 IPCC GL refers specifically to the emissions within each category.

2006 IPCC GL refers to the main 5 carbon pools (i.e. Biomass pool which includes the AGB and the BGB, Dead Organic Matter which includes the Litter and DW carbon pools and Soil Organic Carbon). It is not expected (considering the drivers of deforestation and forest degradation analysis) that the wood products pool will be significant as firewood collection and charcoal production give short lived products.

In summary although we should consider the third approach (tier 3) as the most desirable to be reached (after completing a periodic NFI and/or permanent plots inventory), at least a tier 2 should be used in significant pools (those that represent >10% of forest-related total emissions), and default values may only be applied where a carbon pool represents <15% of total carbon stocks.

We should consider AGB, BGB, DOM and SOC pools, which are currently being measured in the NFI and will be measured in the national network of permanent plots. Emission periods or decay periods proposed by the VCS JNR could be used (AGB 0 years, BGB and DOM 10 years and SOC 20 years) although Indicator 4.220 of the FCPF CF MF refers to the reference period. According to the 2006 IPCC Guideline (Volume 4) a carbon pool is considered significant if it represents >20% of the potential total emissions of its category, but FCPF CF MF standard consider those which account for >10% of the total emissions during the reference period.

[20] Carbon Pools and greenhouse gases may be excluded if: i. Emissions associated with excluded Carbon Pools and greenhouse gases are collectively estimated to amount to less than 10% of total forest-related emissions in the Accounting Area during the Reference Period; or ii. The ER Program can demonstrate that excluding such Carbon Pools and greenhouse gases would underestimate total emission reductions.

Emissions from deforestation and forest degradation should be expressed as net emissions (considering both the carbon stock of the forest being cleared and the carbon stock of the replacement land use). Gross emissions overestimate the impact of avoided deforestation on the atmosphere and 2006 IPCC GL provides methods expecting a comprehensive accounting of emissions throughout different land uses.

To avoid double counting if degradation is accounted separately from deforestation (considering that most deforestation processes start with degradation) it would be highly recommended to derive deforestation emission factors from degraded forests and stratify different types of forests depending on their degree of degradation.

Accuracy Assessment

Regarding accuracy assessment and uncertainty reporting (considering various sources of errors: measurement errors, methodological errors, sampling errors, etc.), FCPF CF MF requires to report two-tailed 90% confidence intervals.

EFs Summary

Emission Factors	Definition
Approach	3. We should consider the third approach; conducting a detailed inventory of key C stocks, with repeated measurements of key stocks through time and modelling) as the most desirable to be reached (after completing a periodic FI; NFI and National Permanent plots Inventory), but at least a tier 2 should be used in significant pools (those that represent >10% of forest-related total emissions), and in any case default values may only be applied where a carbon pool represents <15% of total carbon stocks.
Carbon Pools	We should measure AGB, BGB, DOM and SOC pools (IPCC considers a significant pool if it represents >20% of the potential total emissions of its category and FCPF CF MF and the VCS JNR standards consider those which account for >10% of the total emissions during the reference period). Decay periods proposed by the VCS JNR should be used (AGB 0 years, BGB and DOM 10 years and SOC 20 years).
Accuracy Assessment	Accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category. Allow a relative margin of error of 10%, establishing discounting mechanisms if this is not reached.

Table 11 - Summary of EFs specifications

Monitoring of change in forest land remaining forest land

Developing a FREL/FRL and a monitoring system for degradation involves identifying the causes of degradation, and assessing the likely impact on the carbon stocks (these are linked to selective logging, charcoal and fires followed by grazing and/or shifting cultivation, forest degradation emissions accounting for up to 30% of total emissions according to this analysis).

Approaches

We can consider EOS based methods (direct and indirect approaches) and non-EOS based methods (direct; field inventories and indirect approaches; proxy data) for assessing forest degradation (2015 GOFC-GOLD REDD Sourcebook, and 2006 IPCC GL).

FCPF CF MF allows estimating degradation through the direct method, or if data/method is not available, it allows estimating degradation through other methods such as survey data, proxies derived from landscape ecology, or statistical data on timber harvesting and regrowth. Degradation cause a reduction of carbon stocks mainly on the AGB pool, being the impact lower in the BGB and in some cases in the DOM. The 2006 IPCC GL propose that carbon stocks in the SOC pool and the DOM pool are in equilibrium under Tier 1 level, indicating that changes in these carbon pools are expected to be minor. Therefore, GHG emissions from forest degradation should account for the AGB pool, and the BGB pool if data is available.

The methodological approach we are testing to measure forest degradation is a combination of visual assessment and radar application.

As we have explained before, the entire area of the country is being visually assessed on a 4 x 4 km grid at national level using high and medium resolution imagery. The spatial assessment unit is almost the equivalent to a 3 x 3 block of Landsat pixels (100 x 100 m), where a plot of same dimensions and an internal grid of 5 x 5 points is overlapped. This precise set of data that characterizes the LULC changes produced in the historical series, will be used in this case to decide the training areas for the image stack of Landsat 8 OLI and Landsat 5 TM for the historical AD analysis (training subset, 70% /test subset 30%, see AD Accuracy Assessment). Among the activity data, the characterization and quantification of forest degradation is a great challenge. Visual assessment includes the characterization (precise measurement) of the canopy cover in at least three points in time in case of forest degradation or forest enhancement. This allows us to generate trends in canopy cover changes in at least two different periods.

On the other hand annually composited mosaics from the Japan Aerospace Exploration Agency (JAXA) ALOS PALSAR 1 and PALSAR 2 of years 2007, 2008, 2009, 2010 and 2015, are freely available and could be used for this purpose as a first approach. The ALOS PALSAR L-band intensity dataset at 25 m spatial resolution is slope corrected, ortho-rectified and radiometrically calibrated for both polarizations (HH and HV). The Forest/Non-forest (FNF) map derived from these data classifies forest with the FAO definition (areas larger than 0.5 ha with forest cover over 10%).

The tiles that are needed to cover the entire area of Mozambique can be downloaded from http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/data/index.htm.

HH and HV digital numbers can be converted to gamma naught values with the equation 1 suggested by JAXA and EORC (JAXA 2016).

http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/DatasetDescription_PALSAR2_Mosaic_FNF_revA.pdf.

$$\text{Gamma} = 10 \log (DN2) + CF, \text{ being } CF = -83.0 \quad \text{(eq. 1)}$$

In addition to HV and HH intensity values, other image derived features can be calculated to explore their capacity as potential explanatory variables of the forest AGB. Texture co-ocurrence parameters (mean, variance, homogeneity, contrast, dissimilarity, entropy, second moment, correlation) and the Radar Forest Degradation Index (RFDI) (equation 2), an index related to forest structure (Mitchard et al. 2012) were derived from the 2015 radar images.

$$RFDI = HV - HH / HV + HH \quad \text{(eq. 2)}$$

An initial exploration of the relationship between AGB and PALSAR HV intensity data can be carried out at the plot level. HV intensity statistics (mean, median, stdev, var) would be evaluated in areas centred at the plot coordinates (5x5 pixel windows). The relationship can be explored by forest strata as classified by the NFI data.

In order to obtain homogeneous spatial units for analysis of the AGB-radar data relationship, the most recent (2015) HV intensity image can be segmented with Definiens Cognition Developer Technology®, using the following parameters: colour-shape: 09-01, smoothness: 05, scale 150. This division process should be constrained by the 2015 Forest /Non-Forest mask included in the PALSAR dataset. The polygons generated under this segmentation process are the drivers of all subsequent spatial analysis. Values of HH and HV intensity, as well as RFDI in each polygon can be obtained for further analysis.

An Ordinary Block Kriging process will be used to interpolate the plot level AGB values obtained in the field by the NFI at the polygons resulting from segmentation of the PALSAR data.

Statistics of HV and HH intensity values per polygon can be calculated. AGB values (as derived with the geostatistical approach) – radar attributes at the polygon level will be adjusted with a number of models in Matlab with regress (e.g. linear, polynomial, exponential, log).

The relationship between AGB and radar data is presumably specific over individual strata, where the forest has particular characteristics, and stronger than at the country level. Three spatial levels of stratification will be explored: level 2/level 3 of the LULC National Classification and a Potential Vegetation Classification system.

To assign Forest Type probabilities to each of the polygons obtained from the radar data segmentation, Block Indicator Kriging could be used or a direct assign method if the LULC map 2016 based on sentinel-2 is available.

Finally, values of the HV intensity time series (2007, 2008, 2009, 2010, and 2015) could be compared and trends analysed. As this is a short and irregular time series, an interval approach should be used. Pairs of values for consecutive intervals, as well as the initial-final date interval (2007-2015) would be compared (intensity date 2 minus intensity date 1) and a four class scheme could be adopted in which class zero represents areas with no decreasing HV radar intensity during the 2007-2015 period (that is, intensity remained the same or increased), and class 3 represents areas with continuous decrease of HV radar intensity. It is important to note that this classification would provide just an indicator of possible degradation, and for estimation of the degree of degradation (e.g. level of AGB or cover loss), changes in intensity should be calibrated.

Values of change in canopy cover (from the visual assessment) could be kriged (Ordinary Block Kriging) over the radar derived polygons and again the relations between canopy cover changes and radar series changes will be analysed by strata.

This three stage inventory design joining PALSAR data, high resolution imagery and field sampling will be a scientific and robust approach for forest degradation monitoring.

Some interesting alternatives for improving this workflow could be:

- Incorporating data from **previous field inventories** (e.g. NFI, 2007) would provide opportunities to elaborate more accurate AGB models at a single date and models of change for analysis of temporal AGB dynamics. In time series analysis the inclusion of various dates for calibration has been demonstrated to be highly positive.
- Employing **anniversary data of preferred dates** (e.g. wet season) according to local phenology would facilitate the identification of specific forest characteristics and would help the analysis of real change. Although a composited mosaic built up with data from different dates provides a general overview of forest conditions, it may be obscuring some of the key characteristics of vegetation that only show up during certain seasons.
- Incorporating other polarizations of radar data to evaluate height with **interferometry** would make a big difference for evaluation of AGB.
- Increasing the density and extending the **temporal series of radar data**, ideally to an annual series would facilitate the study of trends in AGB and forest state condition. Time series analysis provides estimations of relative change that can be calibrated with field data of good quality.
- Including other radar derived **metrics** (e.g. texture) in combination with intensity values, as well as features derived from other sources of data (e.g. optical data) might provide accurate models of AGB.
- **Modelling** with machine learning approaches such as Random Forest or Support Vector Machine might provide accurate estimations providing the number of variables and the quality of calibrating samples are adequate.

Accuracy Assessment

We will conduct an:

- Accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two tailed 90% confidence intervals of each category (Olofsson et al., 2014, as it is described in AD Accuracy Assessment).

- Accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category, allowing a relative margin of error of 10%, establishing discounting mechanisms if this is not reached.

Forest Degradation Summary

Forest Degradation	Definition
Approach	▪ Drivers of Forest Degradation: linked to (i) selective logging, (ii) charcoal production and (iii) forest fires followed by (iv) grazing and/or (v) shifting cultivation. ▪ Direct Method: a Continuous Forest Inventory (NFI and National net of permanent plots) combined with forest area change mapping (EOS approach combining high - visual assessment, and medium resolution imagery -multitemporal stack Landsat 8 OLI and Landsat 5 TM-historical period, or multitemporal Sentinel-2 stack) will be the optimal tool to properly identify and quantify changes in forest remaining forest and related carbon stock. ▪ Other EOS methodologies SAR will be tested: three stage inventory design joining PALSAR data, high resolution imagery (visual assessment) and field sampling. ▪ Indirect methods should be also considered for those hardest drivers to be detected.
Carbon Pools	GHG emissions from forest degradation should account for the AGB pool, and the BGB pool if data is available.
Accuracy Assessment	▪ Accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two-tailed 90% confidence intervals of each category (Olofsson et al., 2014). ▪ Accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category, allowing a relative margin of error of 10%, establishing discounting mechanisms if this is not reached.

Table 12 - Summary of Forest Degradation specifications

Monitoring of change in forest land remaining forest land. Non-CO2 emissions from forest fires.

Non-CO2 emissions from forest fires is considered as an independent emission source according to the 2006 IPCC GL. The 2015 GOFC-GOLD REDD Sourcebook also indicates that this GHG emission source should be analysed and according to the most stringent requirement (FCPF CF MF), non-CO2 emissions from fire burning may be excluded if they account for less than 10% of the forest related emissions or if it is conservative to exclude them.

Most forest fires in Mozambique are human-caused, especially during the preparation of the crop fields, honey harvesting, charcoal production, hunting and pasture renewal. Uncontrolled fires occur almost every year throughout the country during the dry season, especially from June to December (and at the beginning of the agricultural and hunting campaigns), when herbaceous vegetation is mostly dried and the deciduous trees and shrubs drop their leaves, thus constituting a potential fuel to be burned. The mean burn-back rate in tropical dry forest systems in Mozambique is very short (3-5 years), which can be a monitoring challenge.

Approaches

The 2006 IPCC GL provide specific equations to estimate non-CO2 emissions from forest fires (Lfire). These are estimated by multiplying Activity Data (AD) by an Emission Factor (EF). The AD is expressed as the area affected by fire (A) while the EF is the multiplication of the fuel loading per unit area (Mb), a combustion factor (Cf), i.e. the proportion of biomass consumed as a result of fire, and an emission factor (Gef), i.e. the amount of gas released for each gaseous specie per unit of biomass load consumed by the fire. The last two factors are usually derived from IPCC tables as local values for these parameters are usually not available, so the estimation of non-CO2 emissions depends on the AD and the mass of fuel available.

$$Lfire = A \cdot Mb \cdot Cf \cdot Gef \cdot 10^{-3}$$

Where:

Lfire is expressed in tonnes of each gas

A in hectares

Mb in tonnes/hectare

Cf is dimensionless

Gef in grams/kilogram dry matter burnt

Accuracy Assessment

'Mb' is derived from the EFs estimated for deforestation in order to ensure consistency, while the 'A' is derived using specific data that tracks fires in forest areas. As we indicated previously a Tier 2 (FCPF CF MF) will be reached. The only carbon pool that should be considered for the estimation of non-CO2 emissions from forest fires will be AGB and DOM. Non-CO2 GHG emissions from burning of SOC and BGB may be considered as negligible (unless we had forest areas on peat lands or organic soils). The same temporal boundaries and accuracy requirements indicated in the general method and forest degradation indirect method will be used for this aspect as well.

Non-CO2 emissions from forest fires Summary

Forest Degradation	Definition
Approach	Lfire = A · Mb · Cf · Gef · 10^(-3) Where: Lfire, non-CO2 emissions from forest fires, is expressed in tonnes of each gas A, area affected by fire, in hectares *Direct Method: a* a Continuous Forest Inventory (NFI and National net of permanent plots) combined with forest area change mapping (EOS approach combining high - visual assessment, and medium resolution imagery -multitemporal stack Landsat 8 OLI and Landsat 5 TM-historical period, or multitemporal Sentinel-2 stack) will be the optimal tool to properly identify and quantify changes in forest remaining forest and related carbon stock • *MODIS active fires and burned areas (University of Maryland /NASA). Monthly fire frequencies from the period 2000-2011 at 500 m spatial resolution;* Mb, fuel loading per unit area, in tonnes/hectare Cf, combustion factor, is dimensionless (fom IPCC tables) Gef, emission factor, in grams/kilogram dry matter burnt (from IPCC tables)
Carbon Pools	GHG non-CO2 emissions from forest fires should account for the AGB pool (based on direct measurement not older than 10 years) and DOM pool.
Accuracy Assessment	Accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two-tailed 90% confidence intervals of each category (Olofsson et al., 2014). Accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category, allowing a relative margin of error of 10%, establishing discounting mechanisms if this is not reached.

Table 13 - Summary of Non-CO2 emissions from Forest Fires

Monitoring of change in Other Land to Forest land. Enhancement of carbon stocks:

Afforestation/Reforestation

Increases in forest area can occur for a variety of reasons, including recovery from fire, natural forest regrowth following crop abandonment, fallow periods in shifting cultivation systems, and growth of tree plantations. Usually these increases occur relatively slowly (although as we have explained before, burn-back

rate in tropical dry forests of Mozambique can be extremely short) being identified after several years. For this reason time series of images should be used to distinguish seasonal behavior from regrowth of secondary forests (e.g. from reforestation/afforestation or crop abandonment).

This section only focus on the enhancement of carbon stocks due to the conversion of other land (i.e. non-forest lands) to forestland, i.e. afforestation/reforestation. Other activities that are eligible under enhancement of forest carbon stocks are excluded in order to remain conservative.

Approaches

The 2006 IPCC Guidelines recommend estimating enhancement of carbon stocks due to afforestation/reforestation activities, under Tier 2, to use the Gain-Loss method for the AGB and BGB pools, either method for the DOM pool and a specific stock-difference method for the SOC pool. But these are not prescribed methods and it will be possible to apply a similar method used for estimating GHG emissions from deforestation consisting in multiplying AD by and EF (negative, i.e. removal factor, considering a linear growth during a transition period to be defined).

$$EFi\,(LULC1 \rightarrow LULC2, t) = \frac{44}{12} \cdot \frac{[Ci\,(LULC1) - Ci\,(LULC2)]}{t}$$

Where:

EFi (LULC1→LULC2,t): Emission factor from change in carbon pool i from LULC 1 to 2 in a transition period t (tCO2e ha-1 year-1);
Ci (LULC1): Carbon density in carbon pool i for LULC 1 (tC ha-1);
Ci (LULC2): Carbon density in carbon pool i for LULC 2 (tC ha-1);
t: Transition period (years).

Therefore for afforestation/reforestation activities, AD methods and carbon stock values will be the same as those defined for forest degradation but considering a transition period. Also textural measures, in particular on Sentinel-2 imagery (10m spatial resolution), will be used to help to distinguish automatically plantations due to the regular spacing of planted trees (2016 benchmark and monitoring). FCPF CF MF allows estimating enhancement of carbon stocks through the direct method, and if this is not available, through other methods such as survey data, proxies derived from landscape ecology, or statistical data on timber harvesting and regrowth.

A specific parameter to be defined is the transition period between initial and final LULC classes or strata, particularly the transition period in assisted natural regeneration. If the carbon stock estimates used to derive the EFs represent the average estimates of all forests (including mature and new growing forests), the transition period may be assumed to be zero, as the new forest would be part of the population and the average estimate of carbon stocks is representative of the whole population. However, if carbon stock estimates used to derive EFs are not representative of all forests, and it represents for instance mature forests, a transition period should be defined.

For AGB, BGB, DOM, and SOC, 2006 IPCC GL assumes a 20 year transition period, but under Tier 2 this may be revised based on local available data. It may be assumed that the increase in the BGB and DOM pools is linearly related to the increase in the AGB pool, and net growth yields could be used in order to estimate the time for a new forest to reach the average estimate. On the other hand if Mozambican-specific growth models for commercial plantations are available for the main species of interest, these growth models could be used to estimate sequestration in the AGB, BGB and DOM carbon pools, using at least IPCC default conversion factors. A default 20 year transition period is assumed for SOC in both cases; assisted natural regeneration and plantations.

It is expected that the implementation of afforestation/reforestation activities would cause an increase in all carbon stocks in degraded lands with low carbon stocks, except in the case of productive grassland transformation that may lead to a net decrease in the SOC pool. It would be recommended to account for all

carbon pools that are being accounted for deforestation in order to ensure a full consistency in GHG accounting for different activities.

As we have explained previously Tier 2 quality must be reached, and default values may be used where a carbon pool represents less than 15% of total carbon stocks, but it would be desirable to implement a Tier 3 through a detailed inventory of key C stocks, with repeated measurements of key stocks through time and modelling. Furthermore the afforestation perimeter will be measured in the field using a GPS with accuracy better than 10 m.

Accuracy Assessment

We will conduct an accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two-tailed 90% confidence intervals of each category (Olofsson et al., 2014) and an accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category, allowing a relative margin of error of 10%.

Afforestation/Reforestation Summary

Aforestation/ReforestationDefinition	
Approach	▪ AD relies on the same methods defined for degradation with the precaution that longer time series are required. Afforestation perimeters should be measured in the field using a GPS with accuracy better than 10 m. Also textural measures, in particular on Sentinel-2 imagery (10m spatial resolution), will be used to help to distinguish automatically plantations due to the regular spacing of planted trees. ▪ EFs, EFi (LULC1→LULC2,t)=44/12·[Ci (LULC1)-Ci (LULC2)]/t Where: EFi (LULC1→LULC2,t): Emission factor from change in carbon pool i from LULC 1 to 2 in a transition period t (tCO2e ha-1 year-1); Ci (LULC1): Carbon density in carbon pool i for LULC 1 (tC ha-1); Ci (LULC2): Carbon density in carbon pool i for LULC 2 (tC ha-1); t: Transition period (years). To be defined: transition period for assisted natural regeneration (AGB,BGB,DOM) and 20 years (SOC). *We should consider tier 3 (conducting a detailed inventory of key C stocks, with repeated measurements of key stocks through time and modelling) as the most desirable to be reached (after completing a periodic FI), but at least a tier 2 should be used in significant pools (those that represent >10% of forest-related total emissions), and in any case default values may only be applied where a carbon pool represents <15% of total carbon stocks.*
Carbon Pools	It would be recommended to account for all carbon pools that are being accounted for deforestation in order to ensure a full consistency in GHG accounting for different activities: we should measure at least AGB, BGB and SOC pools (IPCC considers a significant pool if it represents >20% of the potential total emissions of its category and FCPF CF MF considers those which account for >10% of the total emissions during the reference period). Values for AGB must be based on direct measurement not older than 10 years.
Accuracy Assessment	▪ Accuracy assessment of the LULC and LULC changes (AD) categories, to estimate two-tailed 90% confidence intervals of each category (Olofsson et al., 2014). ▪ Accuracy assessment of the EFs, to estimate two-tailed 90% confidence intervals of each category, allowing a relative margin of error of 10%.

Table 14 - Summary of Afforestation/Reforestation removals

Forest Reference Emission Level (FREL/FRL)

In this section we will explain the overall framework and integration of the National FREL at Provincial (Programs) and local (Projects) level. We can consider three different levels: National, Provincial (Programs) and Local (Projects) with a top-down approach from National to Provincial (Programs) and Local (Project) level but at the same time integrating low level data at the higher levels.

Thus the scale for the FREL would be from National to Provincial (Programs) and Local (Projects) level; where multi-scale nested project-level activities are integrated into an accounting scheme of a larger jurisdiction (top-down approach with integration of low level data at the high level). Procedures for MRV and Reference Emissions Levels will be harmonised between subnational and national levels. The system will be entirely consistent if a common vegetation type stratification for AD and EFs calculations are considered and if we integrate more detailed information from project-level activities in the higher levels (for both elements). In the near future deforestation, degradation and A/R monitoring information at national level and the FREL for these activities will be downscaled to the lower levels (provincial and local). This not only means that there will be consistent monitoring datasets at national level but that these also will gather field information from the lower levels. Provincial (Programs) and Local (Projects) levels may also account for additional activities or additional pools (e.g. enhancement of carbon stocks).

A FREL/FRL is required in order to access performance based payments, as the performance of a REDD+ initiative would be measured by comparing actual GHG emissions and removals with a defined level of GHG emissions or removals (historical emission level or the projected business as usual, BAU, scenario). For selected REDD+ activities (Reducing emissions from deforestation, Reducing emissions from forest degradation, Enhancement of Carbon Stocks: Non-Forest to Forestlands, A/R), the REL and uncertainties will be estimated and reported separately (FCPF CF MF requirement) and as a unique (aggregated):

$$FREL/FRL = FREL_{Deforestation} + FREL_{Forest\ degradation} + FRL_{A/R}$$

Average emissions level (historical FREL/FRL) is the required approach by the FCPF CF MF (in very few cases historical adjusted reference level is allowed) and is the approach followed by Mozambique. It is also recommended to analyse trends (historical adjusted FREL/FRL), using modelling (projection of a FREL/FRL model) to define a realistic BAU scenario.

The FREL/FRL needs to be revised periodically to ensure that new socioeconomic conditions are well gathered and that the most current and accurate information is being used. The FCPF CF MF states that a FREL/FRL must be valid for the period of the ERPA (Emissions Reduction Purchase Agreement), for 5 years.

As we indicated previously, the historical period that was considered in our analysis is 2001-2016, although it could be restricted to the period 2006-2016 if necessary.

A spatial explicit FREL/FRL will be set as a final target. A spatial explicit estimation of GHG emissions and removals would provide more accurate estimates of REDD+ activities and would allow for an understanding of the patterns of deforestation and forest degradation so as to establish appropriate mitigation measures. For this purpose it will be necessary to have spatially explicit historical data for all the activities, or quality spatial covariates to generate it.

Finally, the overall uncertainties of the estimates will be reported as required by the 2006 IPCC GL, and the FCPF CF MF. Reporting at 90% of confidence level is required, and the estimate of the overall uncertainty must be estimated using Monte Carlo Methods as required by the FCPF CF MF.

We have elaborated the following methodological summary for setting REL/RL (table 10):

REL/RL Specifications	Definition
Activities (accounting methods were described in the corresponding sections)	▪ Reducing emissions from deforestation (deforestation from unplanned drivers and planned drivers must be separated in the FREL for deforestation if large scale deforestation, >1000 ha, exceeds 10% of historical deforestation in the historical reference period). ▪ Reducing emissions from forest degradation. ▪ Enhancement of carbon stocks (A/R). ▪ Non-CO2 emissions from forest fires, Conservation of carbon stocks and Sustainable management of forests will be excluded.
Method to set REL/RL	▪ A historical average and a historical trend will be applied, selecting the conservative option. ▪ Projections will be made to understand deviations between the BAU and the historical emission level. ▪ The historical period of the FREL/FRL must cover 15-(10) years ending in 2016 (convincing justification). A benchmark map of 2016 is required as a last point of the historical analysis and for monitoring purposes, for all activities. ▪ A Spatially explicit FREL/FRL will be set for unplanned deforestation and forest degradation.
Updating frequency	▪ Every 5 years.
Uncertainty	▪ Overall uncertainty of the GHG emissions at 90% confidence must be reported. ▪ Propagation of errors must be done through Monte Carlo methods.

Table 15 - Methodological summary for setting REL/RL at Nacional Level

The mechanism for calculating the reference level at national level is planned as a stepwise approach. A zero version is currently available using global AD databases (Hansen *et al.* 2013)[21] and national emission factors (secondary information). A disaggregation of total forest loss to annual time scales, corresponding to loss detected primarily in the year 2001–2014, respectively, was used[22]. In February 2017, when the AD visual assessment is finalized throughout the country, as described above, FREL version 1 will be produced with the results of this analysis and national emission factors. Finally, at the end of 2017 with processed data from IFN, the EFs will be recalculated at the national level and more precise measurements will be obtained in the new and definitive reference level version 2.

Relevant Documents for consultation:

MRV Road Map & presentation

Sentinel2 Mosaics

AD Accuracy Assessment

National Forest Inventory Guidelines

M&MRV Unit design

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements and is now (green).

[21] Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." Science 342 (15 November): 850–53. Data available on-line from: http://earthenginepartners.appspot.com/science-2013-global-forest.

[22] Note that a new methodology within a different historical period is being developed which may offer better results in the upcoming months.

Component 4: Monitoring Systems for Forests, and Safeguards

3.8 Subcomponent: 4a. National Forest Monitoring System

Implementation

MRV overall framework

The MRV system in Mozambique has the same overall framework as the FREL/FRL explained above. We consider a multi-scale (three different levels: National, Provincial and Local) system where selected activities (deforestation, forest degradation and enhancement carbon stocks; A/F) are integrated into an accounting scheme of a larger jurisdiction (top-down approach with integration of low level data at the high level). There will be consistent monitoring datasets at national level but these also will gather field information from the lower levels. Provincial and local levels may also account additional activities or additional pools.

In particular the national PMRV for Mozambique will measure, report and verify the selected activities: deforestation, forest degradation and enhancement of carbon stocks (A/F) through the implementation of a **Continuous Forest Inventory (National Forest Inventory and National Net of Permanent Plots)** combined with **Forest area change mapping** (mainly through several EOS approaches). These results will be gathered and integrated at National Level with access from the provincial and local levels.

AD will be updated every 2 years (consistent with the biennial reporting set under the UNFCCC), but the annual reporting capacity will be generated at the MRV Unit (FNDS) and a new LULC map based on Sentinel-2 can be generated every 5 years. EFs will be updated every 2 years with the survey of the National Net of Permanent Plots (48 plots should be surveyed each year). The NFI could be updated every 10 years to obtain a global, complete and accurate forest information at the national level.

AD will be measured through various activities: all of them have been described in the previous sections except those that aim to gather Community based information on LULC and LULC Changes based on the Adaptation of Participatory tools with available Geospatial technologies (Collect Earth[23])

In the context of a national forest assessment and monitoring, there is neither the time nor financial resources to support participatory approaches and the experience with community-based initiatives, village focus groups interviews and key informant interviews is that informants currently talk in general terms about the forest changes in the area of interest with limited ability to pinpoint the area being discussed. Aerial photographs and satellite images have not proved very functional in the village context, due to high costs, limited availability and need of abstraction of lower resolution imagery. In the early stages of implementation of the national forest inventory it has not been operationally possible to implement the collection forest information and the Social and Environmental variables related to the Safeguards Information System at the same time.

Google Earth covers most rural landscape areas at a high resolution with fairly updated images, meaning that it is possible to view villages and landscapes in considerable detail. It is thus adequate to conduct 'virtual transects'. It would be possible to conduct village focus groups discussions pinpointing areas in the landscape with the assistance of Google Earth. For this purpose Internet connectivity is not necessary, as it is possible to download workable imagery of the village areas to be discussed ahead of time. We would recommend to pilot local level (key informant and focus group) interpretation of Google Earth images in order to assess currents LULC and LULC changes.

[23] Collect Earth is a tool belonging to OpenForis tools set (FAO free open-source solutions for environmental monitoring: http://www.openforis.org/tools/collect-earth.html) that enables data collection through Google Earth. In conjunction with Google Earth, Bing Maps and Google Earth Engine, users can analyse high and very high resolution satellite imagery for a wide variety of purposes.

Through pilot testing of the PMRV system in Mozambique in 15 districts of the Cabo Delgado and Zambezia provinces during the 2018, we will detect optimal areas for local interpretation (square rectangle that represents the surroundings of the village: e.g. 15 km). The Collect Earth tool could be designed in such a way that it facilitates the collection of biophysical forest and social descriptors and information from specific points plotted on a grid though Google Earth. Sampling design and data entry forms could be designed for specific information requirements. The current grid format of Collect Earth actually provides greater opportunities for participatory analysis of the landscape with focus groups than a transect line. It would be possible to sit with a focus group and a computer running Collect Earth and pick out points in the landscape on the grid of particular interest to develop a further understanding of e.g. current LULC, recent or past changes of LULC, management regimes of particular forest blocks, social and economical conditions etc. Thus a combined biophysical and socio-economic survey (e.g., a household survey, part of the SIS) could be conducted at the same time with the proper design of tables and forms that will be more effectively and efficiently answered in a focus groups setting, with the aid of the Collect Earth tool. These forms will be accessible by clicking on the grid plots in Google Earth.

Equations to estimate GHG emissions and removals

The set of equations needed to estimate the GHG emissions and removals (fully consistent with the equations used to define the FREL/FRL) are:

Description	Equations
GHG emissions/removals in the AOI occurring in year t; tCO2 year-1.	$E_{AOI,t} = \sum_{i}^{n} E_{AOI,t,i}$ *i, activities*
GHG emissions/removals in the AOI by activity in year t; tCO2 year-1.	$E_{AOI,t,i} = \sum_{p,q}^{m} E_{AOI,t}(j_{p\to q})$ *$j_{p\to q}$= LULC change from class p to q.*
GHG emissions/removals in the AOI for a change from LULC class p to q in year t; tCO2 year-1.	$E_{AOI,t}(j_{p\to q}) = \sum_{t}^{t-t'} \Delta area_t(j_{p\to q}) \times EF_t(j_{p\to q})$ *t'=Transition period for $j_{1\to 2}$; years.* *$\Delta area_t(j_{p\to q})$, Activity Data, LULC change from class p to q; ha year-1.*
Emission/Removal factor for a change from LULC class p to q in year t; tCO2e ha-1 year-1.	$EF_t(j_{p\to q}) = \sum_{k}^{l} EF_{k,t}(j_{p\to q})$ *k =Carbon pool.* *AG = Aboveground, BG=Belowground, LT=Litter, DW=Dead Wood, SOC=Soil Organic Carbon.*
Emission/Removal factor for a change in carbon pool k from LULC class p to q in year t; tCO2e ha-1 year-1.	$EF_{k,t}(j_{p\to q}) = \frac{44}{12} \times \frac{(C_{pk} - C_{qk})}{t'_k}$ *C_k=Carbon density of carbon pool k of a LULC class; tC ha-1.* *t'_k=Transition period for $j_{p\to q}$ for carbon pool k; years.*

UNFCC: Half width 90% or 95% confidence interval of Emission/Removal factor for a change in carbon pool k from LULC class p to q in year t, tCO2e ha-1 year-1	$CIEF_t(j_{p\to q}) = \frac{\frac{44}{12} \times \sqrt{\sum_k (CI(C_{pk})^2 + CI(C_{qk})^2)}}{t'_k}$ $CI(C_k)$ = Half width 90 or 95% confidence interval of carbon density of carbon pool k of LULC class, tCO2 ha-1.
Half width 90 or 95% confidence interval of GHG emissions/removals in the AOI for a change j from LULC class p to q in year t, tCO2 year-1.	$CIE_{AOI,t}(j) = \sqrt{\sum_t^{t-t'} ((CIEF'_t(j) \times \Delta area_t(j))^2 + (EF'_t(j) \times CI\Delta area_t(j))^2)}$ $CI\Delta area_t(j)$ = Half width 90 or 95% confidence interval of area of transition j in year t, ha year-1.
Half width 90 or 95% confidence interval of GHG emissions/removals in the AOI by REDD+ activity i in year t, tCO2 year-1.	$CIE_{AOI,i,t} = \sqrt{\sum_{p,q}^{m} \left(CIE_{AOI,t}(j_{p\to q})\right)^2}$
Half width 90 or 95% confidence interval of GHG emissions/removals in the AOI in year t; tCO2 year-1.*	$CIE_{AOI,t} = \sqrt{\sum_{i}^{n} (CIE_{AOI,i,t})^2}$

Table 16 - Equations to estimate the GHG emissions and removals in the AOI

*Under the FCPF CF MF the uncertainty of the GHG emissions/removals under the AOI (,) must be estimated using Montecarlo methods as described in the 2006 IPCC GL – Volume 1 – Chapter 3. Equations for the Montecarlo simulation cannot be provided as the simulation consists in conducting various iterations (e.g. 10000 iterations) where the average estimate of the AD, EF and other factors are a random variable following a normal distribution (or other types) with average the estimate and the standard deviation equivalent to the standard error of the estimate.

ER Program CF Buffers

As part of the ER Program CF Buffer[24], two (2) separate buffer reserve accounts will be established, which are ER Program-specific:

1. An *Uncertainty Buffer* to create incentives for improving uncertainty associated with the estimation of ERs and manage the risk that the emission reductions were overestimates for prior reporting periods,
2. A *Reversal Buffer* to insure against potential Reversals.

In addition to the ER Program CF Buffer, the Buffer manager will also establish a *Pooled Reversal Buffer* account to insure against potential large scale Reversals which exceed the amount of ERs set aside in the Reversal Buffer (pooled across all ER Programs for which an ERPA has been signed).

The proportion of ERs that must be set-aside in each buffer reserve account for an initial reporting period may change (for the following reporting periods) depending on quantification improvements or revisions to Reversal Risk assessments.

At the outset of an ER Program, separate accounts must be created in an appropriate ER Transaction Registry for the exclusive purpose of receiving, disbursing, or canceling ERs that will be allocated to the Uncertainty Buffer, the Reversal Buffer and the Pooled Reversal Buffer. Transfers of ERs to and from the accounts, and cancelation of ERs from the accounts, may only be initiated by the Buffer Manager.

The Reversal Buffer and the Pooled Reversal Buffer accounts will exist separately from any reversal risk management accounts established under an ER Program to manage reversal risks for ERs that are not subject to the ERPA and which, therefore, will not be transferred to the CF.

[24] ER Program Buffer Guidelines. Draft, October 2 , 2015. Note that This national registry system will be supported with FIP funds, but its design and implementation is still under consideration and not yet in a design phase. This buffers' management has therefore been included without providing yet more explanations about NRS design, roadmap, etc.

Once Total ERs are determined for a particular reporting period, the ER Program Entity and/or Trustee should instruct the administrator of the ER Transaction Registry to establish serial numbers for the amount of Total ERs and to transfer and deposit a portion of the serialized ERs, as Buffer ERs, into the Uncertainty Buffer account, the Reversal Buffer account and the Pooled Reversal Buffer account. The Calculation Methods for the Uncertainty Buffer account and Reversal Buffer and Pooled Reversal Buffer account, are fully described in MRV Road Map & presentation.

MRV Workflow

As we have explained the MRV system considers a multi-scale (three different levels: National, Provincial and Local) system. There must be consistent monitoring datasets at national level but these also must gather on field information from the lower levels. Provincial and Local levels may also account additional activities or additional pools.

MRV system is centralised at national level in line with UNFCCC decisions relying on existing systems, ensuring the sustainability of the system, and avoiding the creation of duplicities.

The reported results (GHG emissions) must be consistent with UNFCCC communications. Any results reported at sub-national level have to be fully consistent with the UNFCCC communications, meaning consistent with the reported results by the national MRV system.

A workflow for the MRV system is presented below, consisting of the three different levels defined in the overall framework. The lowest level of this MRV system consists of projects or interventions that will have their own monitoring systems to collect relevant information for feeding the Provincial and National MRV systems. The information will include for instance data reported by REDD+ projects (i.e. forest inventories, project areas, detailed mapping of LULC classes, etc.), data reported by M&E systems (e.g. planted areas, etc.) or other data (e.g. biomass surveys, etc.). It is necessary to ensure that all these data is generated and reported in a consistent manner, following certain standards so that they can be incorporated to the national level (e.g. setting guidelines for projects to conduct data collection and reporting).

The provincial level will not collect data directly (except information from relevant provincial programs), but will compile all primary and secondary data from the project level and then check and ensure that all data has been collected and reported following the defined standards or guidelines. The compiled data will be communicated to the National level, where it will be processed. The resulting parameter values from this processing at the National level will then be used by the provincial level for reporting purposes.

The National level will collect primary data and compile primary and secondary data coming from the Provincial level or directly from the Project Level. Additionally, two specific relevant national tasks will be implemented by the National MRV Unit at FNDS; (i) LULC and LULC changes mapping, and the (ii) NFI & National net of permanent plots. With these data the MRV Unit (FNDS) will produce official Activity Data, Emission Factors, revised RELs and related uncertainties at National, Provincial and Project Level. These processed data will then be used to calculate the Emission Reductions in collaboration with the Provincial or Project level (it depends on the Program/Project). Provincial or Project entities will then include these calculations in their program monitoring report, calculating the Emission Reductions that are assigned to each project/intervention area, depending on the benefit sharing mechanisms that will be established.

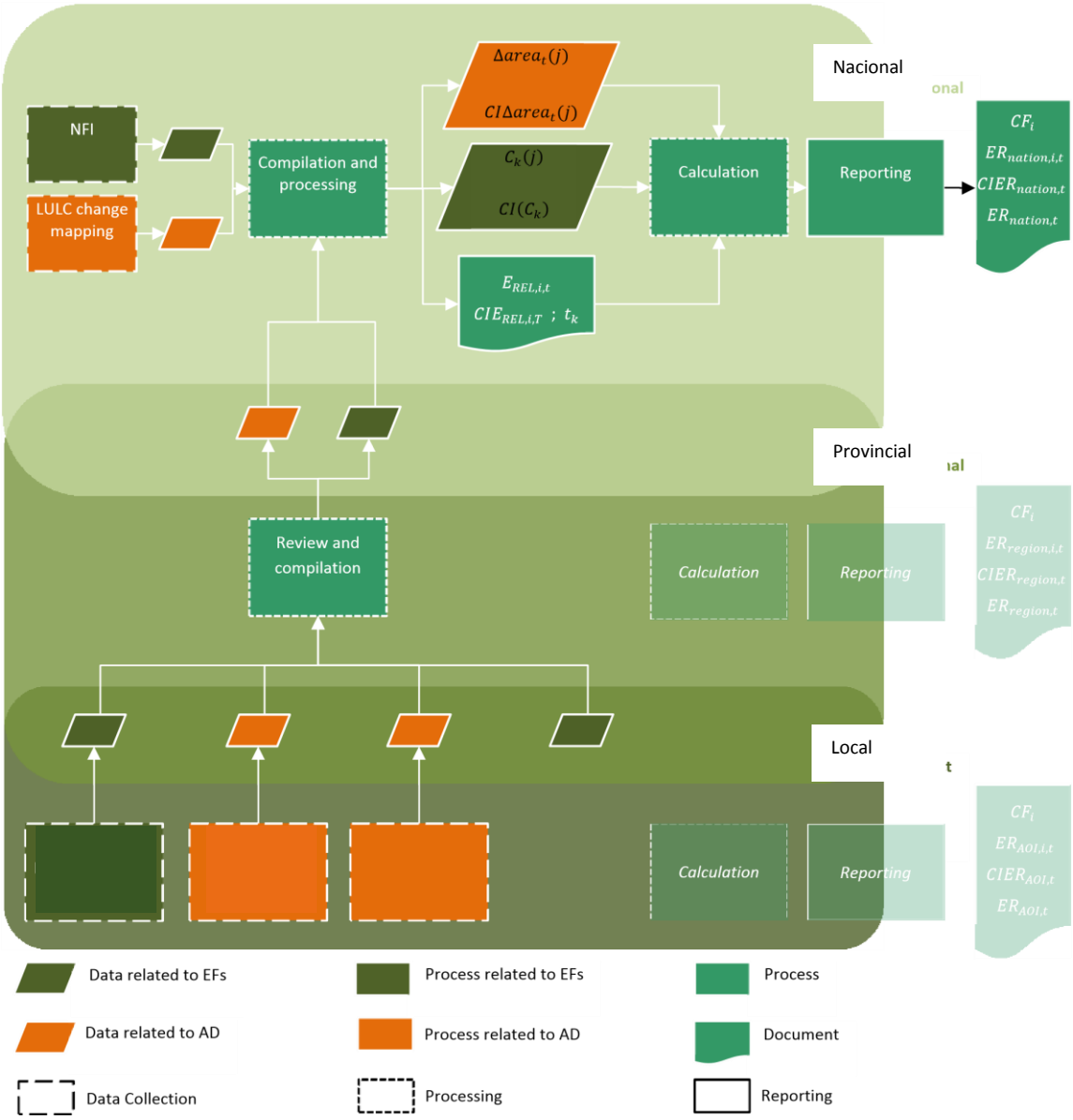


Figure 8 - MRV Workflows. Integration of the National, Regional and Project Level

Higher MRV levels should be fully operational and the specific standards or guidelines for data collection and reporting should be clear and consistent with the national level procedures, for implementing this workflow. While these tasks are carried out, project and program entities are responsible for collecting, processing, analysing, and reporting all required information, following the standards and guidelines that are currently being developed.

Organizational structure, responsibilities and competencies

In this section we provide an overview of the organization structure, responsibilities and competencies of the various MRV levels that we defined before. So far, the only institutions that have a defined MRV function are at the National level:

1. **MRV Unit** at FNDS: it is a technical unit with 5 specialists with background in Remote Sensing & GIS and Forest Resources assessment. It is the technical Unit directly involved in AD analysis (reporting deforestation, forest degradation and enhancement of carbon stocks A/R), LULC and LULC Change

maps preparation, and EFs analysis (technical support, logistics and data processing for the National Forest Inventory, EFs calculation and updating process).They are also responsible of compiling and processing all relevant information from lower levels and operationalize the geographic information management system and databases, MRV platform, hosted in the two servers located in the offices of FNDS. Any General Directorate of the MITADER or other Ministries to which the corresponding permissions are granted can have direct access to this information for consultation and editing through the MRV web platform. They will also have access from the provincial and local levels.

On the other hand it is planned to design on this platform of information, specific tools and applications for groups of users.

All technical design features of this information portal and production unit are detailed in the M&MRV Unit design.

2. **MRV Task Force:** Planned. This would be a technical group monitoring and providing support and technical advice for the main components of the system. The Task Force would be composed of representatives of MITADER Directorates, Other Ministries, Statistical Agencies, CENACARTA, several academic and research institutions (UEM, IIAM,…), NGOs, and international organizations (WB, FAO, etc.).

   There are many institutions with which the flow of information and services must remain open: some examples are: DINAT(Land Delimitation, Land DUAT's), CENACARTA (Topography maps, Satellite Imagery), IIAM (Soils, Permanent Plots), INE (Human Settlements), MOPH (Infraestructures, Hidrology), ANAC (Conservation areas), MMAI (Hidrology), DINAF (Forest data), etc.

At provincial level, the department that has been mandated with a REDD MRV functions is the UT-REDD+. In the near future a small MRV team will be established and will be assigned with MRV responsibilities:

3. A **Provincial MRV team** with two specialists at the UT-REDD+ Provincial Coordination Units will coordinate the MRV functions that are responsibility of the provincial level;
4. **Project/Program implementers** will develop their own monitoring system to collect relevant information of the projects (forest inventory, project areas, detailed mapping of LULC classes and changes), reporting to the Provincial/National Units in a consistent manner, following certain national standards.

   At Local Level, both systems PMRV and SIS, as we have explained before, will stand by the participation of local communities through selected agents.

The responsibilities of each of these parties and how they would interact is provided in the following table:

Activities	National Level	Provincial Level	Project Level / Communities
Measurement	▪ MRV Unit at FNDS will produce the LULC map and disaggregate it into adequate forest classes and will implement the AD analyses. ▪ MRV Unit regularly will collect primary and secondary data (AD/EFs) from lower MRV levels, will analyze and compile this data. ▪ The MRV Unit elaborates the GHG emission calculation at national, provincial and project level.	▪ MRV team at provincial UT-REDD+ will collect, compile and analyze primary and secondary data on project interventions, e.g. emission factors, boundaries of activities, LULC changes, etc. This includes databases, GIS and remote sensing data.	▪ Project implementer will design its own monitoring system (following national guidelines) and will collect and analyze primary and secondary data within project boundaries; e.g. forest inventory data, boundaries of activities, LULC changes mapping, etc. This information includes databases and GIS data. Relevant forest information and socio-economic and environmental information will be collected at Community level.
Reporting	▪ MITADER (appropriate directorate) is responsible for reporting at international (UNFCCC) and National Level and also for generating the information in collaboration with provincial institutions and project implementers for program and project reports. ▪ MITADER (appropriate directorate) reports to UNFCCC.	▪ UT-REDD+ is responsible for compiling results from the Provincial MRV Unit for the province and reports in form of a Monitoring Report.	▪ Project implementer is responsible for compiling results from the Federal MRV Unit and Regional MRV Unit for the project and reports in form of a Monitoring Report.
Verification	▪ Third party national or international (accredited agency)		

Table 17 - MRV Institutional arrangements and roles

Relevant Documents for consultation:

MRV Road Map & presentation

M&MRV Unit design

Assessment

Both stakeholders and the Mozambique government concur that this thematic area has seen improvements, but that more work needs to be done on working out technical details and initiating testing of the systems in practice. (yellow).

3.9 Subcomponent 4b: Information System for Multiple Benefits, Other Impacts, Governance, and Safeguards

The National REDD+ Strategy explicitly states that the standards, procedures and guidelines for monitoring and measuring REDD + activities and results in Mozambique should ensure the **active participation of local communities** (participatory or community-based MRV; PMRV), and include useful information for the definition of **environmental indicators** related to the reduction of deforestation and forest degradation and related emissions, **economic and social indicators** linked to integrated rural development, as well as the specific indicators of **environmental and social safeguards**, as set out in the Environmental and Social Management Framework (ESMF) of REDD+.

Safeguards instruments, elaborated during the preparation of the REDD + process, are the Strategic Environmental and Social Assessment (SESA), the Environment and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF), which includes the Complaints Mechanism. The ESMF and PF have been cleared by the World Bank, and the SESA final draft was prepared and will be submitted to the bank clearance by March.

In compliance with the principles of REDD + implementation, and within the framework of the UNFCCC, a Safeguards Information System (SIS) will be developed and implemented to provide information on how safeguards are handled and respected. This is a necessary requirement to obtain payment by results.

The SIS is expected to be simple, accessible, inclusive, transparent, auditable, comprehensive and according to national legislation. The process of collecting information involves various partners from base community organizations, government and civil society organizations.

The implementation of safeguards and the creation of the REDD + Safeguards Information System (SIS) should be gradual and follow a participatory approach. It is still in an initial stage in Mozambique which demands a coordinated structure to enable the full participation of stakeholders (community, private sector, government and civil society).

Principles:

- Compliance with legislation and good governance,
- Promoting transparency and public / social responsibility,
- Respect for local culture and traditions,
- Ensure the significant participation of affected people and stakeholders (especially the most vulnerable)
- Ensure consultation functions as a conflict resolution mechanism
- Protect and conserve forests, contribute to the improvement of the multiple functions of the forests.

The list of SIS indicators presented below is a proposal prepared after consulting with various institutions involved in the process, reviewing the technical notes for preparing the Project Appraisal Document (PAD) of MozFIP and the MozDGM project, as well as bibliographical revision with special attention to the guide of good practices to identify areas of high conservation value. This list must be harmonized through planned seminars with stakeholders.

The methodology to be used for the monitoring process of indicators includes interviews, questionnaires, direct observation and public consultations whenever necessary. Continuous dissemination programs will be part of the process to enable stakeholders to be actively involved, making for efficient and transparent implementation of REDD + projects and initiatives in the region.

Item	sub-item	Description	Scale (National, Landscape, Community)	Responsible
Environmental / Ecological	Forests	Reforested Area (Increase of coverage percentage)	National, Landscape	DINAS, DINAF
		Reforested areas (New planting areas established)	National, Landscape	DINAS, DINAF
		Rehabilitated forest area	Landscape	DINAF e DINAS

Item	sub-item	Description	Scale (National, Landscape, Community)	Responsible
		Information on existing management plans (updated)	Landscape	DINAF; ANAC;
		Burned areas	National, Landscape	DINAF; ANAC
		Environmental Management Plan	Landscape	DINAF; ANAC
		Fires	Nacional, Landscape	DINAF; ANAC
	Biodiversity	Registration of fragile ecosystems	Landscape	
		List of endangered species (fauna and flora)	Nacional, Landscape	DINAF, ANAC
		Protected species (fauna and flora) survey	Nacional, Landscape	DINAF, ANAC
		Percentage of native area preserved in the concession (20% conservation law)	Landscapes	DINAF, PS (Service provider)
		Census faunistico (2 in 2 years in the conservation area)	Landscapes	ANAC
	Soils	Soil quality information	Landscapes	IIAM
		Areas of sustainable agriculture (agroforestry and conservation systems)	Landscapes	DINAS, SP
		Registration of use of agrochemicals	Landscapes	DINAS, SP
	Water resources	Pollution registry of water lines (agrochemicals)	Landscapes	DINAS, SP
		Pollution registry of water lines (sediments)	Landscapes	DINAS, SP
Socio cultural/Economicos	Cultural heritage	Registry of existing cultural rituals	Landscapes, Comunidades	CGRN´s , SP, SIDAE
		Registry of sacred sites	Landscapes, Comunidades	CGRN´s , SP, SIDAE
		Number of complaints attended	Landscapes, Comunidades	CGRN´s , SP, SIDAE
	Land tenure	Number of DUAT's holders	Landscapes, Comunidades	DINAT, SPGC
		Number of informal certificates issued	Landscapes, Comunidades	DINAT, SPGC
		Number of individuals with "occupation of good faith and customary practices"	Comunidades	DINAT, SPGC, SIDAE, CGRN, SP
		Number of disputes submitted and resolved (including complaint channels used)	Landscapes, Comunidades	CGRN´s , SP, SIDAE
	Land Use Changes	Grassland areas acquired for forest plantations	Landscapes	DINAT, SPGC
		Areas of Agriculture Purchased for Forest Plantations	Landscapes	DINAT, SPGC
		Number of community members involved in forest plantations / Partnerships and / or employment	Comunidades	SP
	Training	Number of community members involved in REDD + / FIP / DGM capacity building (by sex)	Comunidades	SP/FNDS
		Number of supported associations and forums	Landscapes, Comunidades	SP/FNDS
		Number of operators involved in training	Landscapes	SP/FNDS
		Number of charcoal workers involved in training	Landscapes, Communities	SP/FNDS
		Number of trained institutions and technicians	National, Landscape	SP/FNDS
		Number of villages and beneficiaries (disaggregate)	Landscapes, Communities	SP/FNDS

Item	sub-item	Description	Scale (National, Landscape, Community)	Responsible
	Other beneficiaries	Number of community members with access / information on sustainable technologies for biomass energy use (dissemination programs)	Landscapes, Communities	SP/FNDS
		Community projects: Number of Community projects / initiatives supported	Landscapes, Communities	SP/FNDS
		Number of workers employed in forestry plantations	Landscapes, Communities	DINAF, DINAS, SP/FNDS

Table 18 - Proposal of SIS indicators

Key findings for PMRV design

After the International/National review of PMRV practices, the following key points were defined:

Scope

The main objective of the *'participatory'* component of a PMRV is to collect local carbon stock data to improve carbon accounting at national level (in compliance with international standards) and increase the participation of local communities to maximize the co-benefits of REDD+. But information has to be carefully defined and complemented: **carbon stocks** (main component but **pools** must be specified), **additional forest variables** (**non-carbon data**), variables on **drivers of deforestation and forest degradation**, **activity data** (**activities** must be established), **environmental and social information and impacts** of REDD+ implementation (safeguards information system, SIS). Information must be **simple** to measure and report, **accurate** (according to national and international standards), based on **robust and proven methods**, **cost and time-effective** avoiding high opportunity costs and **useful to the community**.

Methods

Monitoring and measuring methods should be **simple** but scientifically **robust** and unbiased to provide accurate and reliable data. The use of **new technologies** (e.g. forest surveys or remote sensing mapping using digital devices; tablets or smartphones, drones, etc.) should first be tested in areas where communities are already involved in monitoring.

Training program

A key point in a PMRV system for feasibility and sustainability purposes is to strengthen local capacities and autonomy since the monitoring and reporting skills often reside in intermediary organizations instead of the communities themselves. It is therefore necessary to design a complete program to conduct Training of Trainers (ToT) on data collection, data processing and data reporting for project staff, local representatives and key roles in the local MRV system developed (at all information and data processing levels: **National Level**: MRV Unit – UT-REDD+, UTREDD+; **Provincial Level**: Provincial REDD+ Coordination, MRV Provincial focal point, **District Level**: MRV District focal point).

Scaling up monitoring program

A remote sensing analysis will be necessary to compare the gap between local and national approaches. The methods to integrate the local information into the national system should be tested and ready to be used.

Validation

A reliable verification process needs to be designed and implemented for national data integration consistency and for international reporting (direct requirement in a project or nested approach).

Environment and incentives

The system needs to be **embedded into community based forest management** so the information can be used to improve management decisions as well as MRV purposes (see above; information useful to the community). This combination can easily deliver economic, social and environmental benefits for the local communities (livelihoods, organizational capacities, negotiating skills, environmental awareness, ecosystem services and conserving biodiversity) (Hawthorne & Boissière, 2014). Nevertheless a social analysis to probe the enabling conditions for local participation, including **a priori detailed incentives analysis**, is needed to motivate individual involvement in PMRV (financial, social and personal incentives).

PMRV as a cog in the wheel

PMRV should be incorporated into community based forest management system and into the multilevel MRV system (including into the national forest inventory) to take advantage of the existing local management systems with standardized practices and methods. A **governance analysis to understand data flow** (roles of members of local communities) is also needed.

PMRV & SIS

There is a significant potential contribution for PMRV to maximize the co-benefits of REDD+ and implement REDD+ safeguards information system (SIS).

Financing PMRV

Discussion is taking place on what the function of the collected data will be regarding the way that benefits are to be distributed, and on providing protocols for the PMRV. Experiences suggest that the best solution might be a hybrid system in which forest enhancements (stock increases) are rewarded on an output basis at the level of the individual forest parcel, while the financial returns from reductions in emissions from deforestation and degradation (assessed at regional level) would be used to fund input-based incentives.

Addressing Safeguards in the Readiness Phase

The preparation of the safeguards instruments took into account the 2010 Cancun decisions on environmental and social safeguards for REDD + implementation. The process of consultation and engagement is continuous and is accompanied by the dissemination of concepts on social environmental safeguards and good practices.

Bibliographic reviews were carried out on the national legal framework and international conventions to which Mozambique is a signatory, as well as the public policies on environmental and social safeguards in the country. A public engagement and consultation plan was prepared, including the preparation phase, and was carried out with the implementation of consultations (central, provincial and community level), visits to REDD projects and specific meetings and the production of reports.

The next phase following approval of the instruments involves the preparation of guidelines on environmental safeguards and partners and elaborating the grievance manual and dialogue mechanism, along with training particularly at the local level on concepts and benefits.

In the preparation phase, some of the aspects specifically considered were: i) Legal compliance; (ii) Recognition and respect for the rights to use land and natural resources as well as respect for local habits and culture; (iii) Economic sustainability of REDD + initiatives and improved quality of life through economic and sustainable diversification of natural resource use, (iv) Contribution to the conservation and restoration of natural ecosystems and biodiversity, and (v) Ensuring a participatory process of stakeholders in all phases from preparation to implementation and monitoring, providing information to the fullest extent possible.

Assessment Criteria - Subcomponent: 4b. Information System for Multiple Benefits, Other Impacts, Governance, and Safeguards

32. Identification of relevant non-carbon aspects, and social and environmental issues

The National REDD+ Strategy explicitly states that the standards, procedures and guidelines for monitoring and measuring REDD + activities and results in Mozambique should ensure the **active participation of local communities** (participatory or community-based MRV; PMRV), and include useful information for the definition of **environmental indicators** related to the reduction of deforestation and forest degradation and related emissions, **economic and social indicators** linked to integrated rural development, as well as the specific indicators of **environmental and social safeguards**, as set out in the Environmental and Social Management Framework (ESMF) of REDD+ initiatives.

Safeguards instruments, elaborated during the preparation of the REDD + process, are the Strategic Environmental and Social Assessment (SESA), the Environment and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF), which includes the Complaints Mechanism. The ESMF has been approved (Jan 2017) at the level of the RSA (Regional Safeguards Advisor). The SESA final draft was prepared and will be submitted to the bank clearance by March.

33. Monitoring, reporting and information sharing

In compliance with the principles of REDD + implementation, and within the framework of the UNFCCC, a Safeguards Information System (SIS) will be developed and implemented to provide information on how safeguards are handled and respected. This is a necessary requirement to obtain payment by results.

The SIS is expected to be simple, accessible, inclusive, transparent, auditable, comprehensive and according to national legislation. The process of collecting information involves various partners from base community organizations, government and civil society organizations.

The implementation of safeguards and the creation of the REDD + Safeguards Information System (SIS) should be gradual and following a participatory approach. It is still a incipient process in Mozambique that demands a coordinated structure to enable the full participation of stakeholders (community, private sector, government and civil society).

The list of SIS indicators that has been elaborated, is a proposal prepared after consulting with various institutions involved in the process, reviewing the technical notes for preparing the Project Appraisal Document (PAD) of MozFIP and the MozDGM project, as well as bibliographical revision with special attention to the guide of good practices to identify areas of high conservation value. This list must be harmonized with stakeholders through seminars. This has already occurred at the national level and must still be carried out at the level of the Zambezia and Cabo Delgado landscapes.

The methodology to be used for the monitoring process of indicators includes interviews, questionnaires, direct observation and public consultations whenever necessary. Continuous dissemination programs will be part of the process to enable stakeholders to be actively involved, making an efficient and transparent implementation of REDD + projects and initiatives in the region.

34. Institutional arrangements and capacities

It is expected that the organizational structure, responsibilities and competencies related with the SIS, follows the same scheme and is supported by the PMRV System at National, Provincial and Local Level under the coordination of the National Safeguards Specialist and with the participation of the selected provincial

experts and local key informants. At Local Level, both systems PMRV and SIS will stand by the participation of local communities through selected agents.

In terms of the capacity strengthening needed to strengthen monitoring, reporting and information sharing on multiple benefits and safeguards, the following priorities have been identified:

- Continuous training on safeguards: concepts, relevance, mechanisms, and benefits;
- Capacity building at the local level on the national legal framework, specifically land and natural resource management including international policies and good practices;
- Operationalizing dialogue mechanisms that ensure the efficient participation of the different stakeholders, and in particular local communities.

Relevant Documents for consultation:

Environmental and Social Management Framework for REDD+ in Mozambique

Relatório sobre Envolvimento dos Actores-chave no Processo de Elaboração do SESA para o REDD+

Resumo das Consultas Públicas

Planilha das Consultas Públicas

Facebook REDD+

Assessment

While some stakeholders classified this subcomponent as yellow, there was acknowledgement from these participants that this was a reflection on the early stages of Mozambique's implementation phase rather than the Readiness phase, partly due to the wording provided in the FCPF Readiness Framework questions.

As a result, the Mozambique government believes that this thematic area is indeed green when attention is focused on the Readiness stage, while recognizing the need for more work to be done.

At the same time it is recognized that technical documents about consultations still need to be translated into effective measures for communicating with local and community stakeholders without higher levels of academic training, and that the effectiveness of these measures can only be analyzed following their implementation.

4 Report and Results of the Participatory Self-Assessment Process

4.1 Report on the consultation process

Preparation of the Self-Assessment Process

The R-Package was put together by the FNDS with the help of a national consultant. The information in this document is drawn from the vast amount of information that has been produced by Mozambique over the past ten years, but focuses on the outputs of the last three years.

Since each of individual components of the R-Package has been subject to wide ranging consultation as demonstrated in the Annex (the constantly updated lists is available online as well), the decision was made to have only one specialized consultation on the R-Package draft document as well.

This draft was circulated on December 15th to all the regular participants and invitees to the REDD+ strategy and consultation workshops, and the meeting was held in Maputo on January 12th, 2017. The consultation was attended by 32 participants, predominantly government representatives from 7 different Ministries (MASA, MIREME, MEF, MINT, MAEFP, MIC, MITADER – represented by 4 different internal departments/agencies). The private sector, academia, and the donor community were also represented.

Following the self-assessment, the results of this seminar have been processed and adjusted by FNDS as is explained in the following sections.

Assessment Process

No.	Criteria	Jan 2017	Stakeholder Assessment
	Subcomponent 1a		
1	Accountability and transparency		
2	Operating mandate and budget		
3	Multi-sector coordination mechanisms and cross-sector collaboration		
4	Technical supervision capacity		
5	Funds management capacity		
6	Feedback and grievance redress mechanism		
	Subcomponent 1b		
7	Participation and engagement of key stakeholders		
8	Consultation processes		
9	Information sharing and accessibility of information		
10	Implementation and public disclosure of consultation outcomes		
	Subcomponent 2a		
11	Assessment and analysis		
12	Prioritization of direct and indirect drivers/barriers to forest carbon stock enhancement		
13	Links between drivers/barriers and REDD+ activities		
14	Action plans to address natural resource rights, land tenure, governance		
15	Implications for forest law and policy		
	Subcomponent 2b		
16	Selection and prioritization of REDD+ strategy options		

17	Feasibility assessment		
18	Implications of strategy options on existing sectoral policies		
	Subcomponent 2c		
19	Adoption and implementation of legislation/regulations		
20	Guidelines for implementation		
21	Benefit-sharing mechanism		
22	National REDD+ registry and monitoring system		
	Subcomponent 2d		
23	Analysis of social and environmental safeguard issues		
24	REDD+ strategy design with respect to impacts		
25	Environmental and social management framework		
	Subcomponent 3		
26	Demonstration of methodology		
27	Use of historical data and adjustment for national circumstances		
28	Technical feasibility of the methodological approach, and consistency with UNFCCC/IPCC guidance and guidelines		
	Subcomponent 4a		
29	Documentation of monitoring approach		
30	Demonstration of early system implementation		
31	Institutional arrangements and capacities		
	Subcomponent 4b		
32	Identification of relevant non-carbon aspects, and social and environmental issues		
33	Monitoring, reporting and information sharing		
34	Institutional arrangements and capacities		

Table 19 - Summary of the stakeholder consensus resulting from the participatory self-assessment

Comparison with Mid Term Review Classifications and Stakeholder Inputs

Criteria	**MTR**	**Self-Assessment (R-Package)**	**Stakeholder Opinion**
Subcomponent 1a **-** National REDD+ Management Arrangements			
Subcomponent 1b **-** Consultation, Participation, and Outreach			
Subcomponent 2a- Assessment of Land Use, Land Use Change Drivers, Forest Law, Policy and Governance			
Subcomponent 2b **-** Strategy Options			
Subcomponent 2c **-** Implementation Framework			
Subcomponent 2d- Social and Environmental Impacts			
Subcomponent 3 **-** Reference Emission Level			
Subcomponent 4a **-** National Forest Monitoring System			
Subcomponent 4b **-** Information system on multiple benefits, other impacts, governance, and safeguards			

Table 20 - Comparison with Mid Term Review Classifications and Stakeholder Inputs

An initial comparison of the results of the Mid Term Review and the current situation shows a significant improvement across the board on the subcomponents. As mentioned in the text, large strides have been made in finalizing and approving the National REDD+ Strategy, including all the analytic inputs needed, the development of the Monitoring and information systems, and public consultation and Safeguards.

Indeed, Mozambique has made such significant progress that it is already beginning implementation activities in several pilot landscapes.

In fact, due to this progress, the stakeholder workshop held in January 2017 focused to a large extent on the issues and challenges of implementation, rather than the Readiness Process, as can clearly be seen by the comments and recommendations in the tables below. For this reason, some of the items are highlight as red, despite the fact that this assessment was about the readiness phase.

Overall, there are 12 aspects that the stakeholders have classified more harshly than the national self-assessment. The two main reasons for this in our view are: (i) a focus by stakeholders on the implementation phase rather than the Readiness phase; and (ii) a lack of time to have fully absorbed the recently finalized and approved REDD+ National Strategy and Action Plan. The details of these divergences are discussed below in more detail in the comments following each specific sub-component.

When the focus is kept exclusively on the Readiness Process, the government of Mozambique is firmly of the opinion that significant and relevant progress has been made in all areas since the Mid Term Review was concluded.

4.2 Results of the Participatory Self-Assessment

Subcomponent 1a. National REDD+ Management Arrangements

No.	Criteria assessed	Strengths/ Weaknesses	Activities needed to improve weaknesses
1	Accountability and transparency		
2	Operating mandate and budget		To clarify the role of FNDS, MITADER and other units as well as other institutions outside the MITADER, the role of the FNDS should be coordination and technical back-up, and monitoring of implementation of activities and identification of more initiatives and partners, mobilization of funds, etc.
3	Multisector coordination mechanisms and cross-sector collaboration	The roles of the institutional focal points in implementation is not yet clear, nor is the degree to which FNDS is an "implementer", a "contracting party", or a coordinator of government actions	The FNDS should stop being an implementer to have the role of coordinator, supervision, accountability, monitoring and search of new partners including those that are against REDD Include linkages with the Ministry of Public Works because of Water management issues. At the level of the government of the province the provision of quarterly accounts must be institutionalized. It is necessary that the other government departments internalize their obligations and responsibilities under the REDD+ program.
4	Technical supervision capacity		While this exists at the national level, it needs to be strengthened at the local level.
5	Funds management capacity		Also needs to be strengthened at the local level.
6	Feedback and grievance redress mechanism	The current structures will need to be tested under implementation.	Tools for of Feedback and grievance redress within the safeguards must be made more user-friendly. Consultation work has to be continuous and use local structures.

General Comments:

The reasons for stakeholder´s lower ranking of Subcomponent 1a appear to be linked to the greater emphasis placed by the participating stakeholders on the lack of understanding of the roles in implementation for the various other state bodies vis-a-vis the FNDS/UTREDD. The changing position of the UTREDD and UGFI from being a unit within the Ministry of Land, Environment and Rural Development, with direct line management from the Minister, to being a Directorate (the *Pelouro para a Mobilização de Recursos*) within the newly reformulated Fund for Sustainable Development (FNDS) has not helped to clarify this division of responsibilities and authority.

However, these concerns are primarily concerned with implementation issues, not readiness, which all generally agree has been achieved. In fact, even at the Mid Term Review stage, this sub-component had been considered as green, and these reasons are put forward by the government to justify the current evaluation.

Subcomponent 1b. Consultation, Participation, and Outreach

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
7	Participation and engagement of key stakeholders	Consultation in 6 Provinces directly and all other indirectly. At the national level, 3370 people consulted (2392 men and 978 women)	It is necessary to continue the engagement process, particularly to stimulate women´s participation
8	Consultation processes	About 1/3 of the people involved were women There has been involvement of organizations representing women who are very active	We must continue to work towards improving the quality of the consultation process Implementation actions should continue and go deeper into the issues in general as well as increase the participation of women
9	Information sharing and accessibility of information		
10	Implementation and public disclosure of consultation outcomes	Divulging activities and the results of the consultations themselves is not yet sufficient and it is important to do it	Greater disclosure of how consultation has influenced the outcomes.

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements (green).

Subcomponent 2a. Assessment of Land Use, Land Use Change Drivers, Forest Law, Policy and Governance

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
11	Assessment and analysis	The technical studies of the drivers of deforestation are not sufficiently accessible to a wider audience.	Simplified versions would be useful.
12	Prioritization of direct and indirect drivers/barriers to forest carbon stock enhancement	Some doubts about the results of the Winrock study showing that exploitation for timber production has almost the same impact on emissions as the production of charcoal.	More technical discussions are needed on methodologies and analysis.
13	Links between drivers/barriers and REDD+ activities	Some participants questioned whether the actions were specifically aimed at the drivers of deforestation.	Better divulgation of the newly approved strategy and plan of action is necessary.
14	Action plans to address natural resource rights, land tenure, and governance	Some participants questioned whether any actions were	Better divulgation of the newly approved strategy and plan of action is necessary.

		specifically aimed at these aspects of deforestation.	Note that the government has a plan to attribute 5 million land titles.
15	Implications for forest law and policy	There are many activities of legal reform that are not all coordinated and so contribute to overlaps and activities occurring in parallel.	More coordination amongst the different groups would be useful.

General Comments:

While some stakeholders classified this subcomponent as yellow, there was acknowledgement from these participants that they were not very familiar with the approved strategy and action plans (REDD+ Strategy approved in late Nov and assessment conducted in Jan). As a result, the Mozambique government believes that this thematic area is indeed green based on the quality of and detail contained in these documents.

At the same time it is recognized that these highly technical documents will need to be simplified in order to reach a wider audience, particularly those without higher levels of academic training.

Subcomponent 2b. Strategy Options

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
16	Selection and prioritization of REDD+ strategy options	The process involved consultation and participation of various sectors and stakeholders.	-
17	Feasibility assessment	The implementation plan foresees the period 2016-2019, as well as preparation and experimentation for the effective implementation of the REDD + Strategy.	-
18	Implications of strategy options on existing sectoral policies	It represents an added value by bringing together sectoral strategies, activities, funds / resources towards sustained and integrated development.	There is still the need for each sector to take greater ownership of the REDD+ processes under their leadership, and incorporate the spirit and the practical activities into their plans.

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements (green).

Subcomponent 2c. Implementation Framework

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
19	Adoption and implementation of legislation/regulations	The REDD + Strategy considered related legal instruments, eg: National Reforestation Strategy; National Development Strategy (2015-2035), Five-Year Government Program (PQG 2015-2019)	Roll out and effective implementation planned for 2020-2024-2030). The details of this still must be worked out

		However, while related legal instruments are being implemented, but the REDD + Strategy as such is not yet in implementation	
20	Guidelines for implementation	Since implementation has not yet begun in earnest, stakeholders expressed concern that the REDD+ Strategy only recommends that issues of carbon rights and benefit sharing be more fully analyzed. However, a benefits sharing system is piloted in the Zambezia Landscape The lack of an effective registry or approval process for REDD+ projects is also noted.	Benefit sharing mechanism and carbon rights must be clearer and more detailed. An effective registry and approval process for REDD+ projects must be developed.
21	Benefit-sharing mechanism	Some examples of this exist, such as the experiences of the 20% of forest and tourism exploration fees, as well as the 50% of the fees resulting from fines paid to persons involved in the seizure.	Specific benefit sharing mechanisms for REDD+ must be developed
22	National REDD+ registry and system monitoring REDD+ activities	Forest Information Platform (JICA) is being developed, as is the MRV system.	These platforms must be operationalized and harmonized with each other.

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen improvements, but that more work needs to be done on working out and formalizing the details for REDD+ project implementation (yellow).

Subcomponent 2d. Social and Environmental Impacts

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
23	Analysis of social and environmental safeguard issues	There has been a separate consultation process on safeguards and the 2 main documents of environmental and social management are at the approval stage (submitted for approval in early Jan 2017).	Consultations should be a constant process
24	REDD+ strategy design with respect to impacts	There is a need to better clarify the interaction relations between SESA and the REDD + Strategy and vice versa	. Clarify how the SESA informed the Strategy and vice versa
25	Environmental and Social Management Framework	The REDD+ specific ESMF is not yet being implemented but other complementary programs (MozBIO, Landscape) are already in the implementation phase. But it is too early to assess its impact.	Divulgate the ESMF

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements and is REDD+ Ready (green). The latest documents demonstrate the relationship between the SESA and the REDD + Strategy but this has yet to be fully absorbed by all stakeholders.

Component 3: Reference Emission Level

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
26	Demonstration of methodology	There is a IFN methodology developed	Need for allometric equations for evergreen forests and Mopane; Need for studies to clarify some forest types that are currently difficult to understand; Need to monitor the dynamics (growth) of the forest
27	Use of historical data, and adjusted for national circumstances	Using Collect Earth and other associated tools; Includes high, medium resolution maps	
28	Technical feasibility of the methodological approach, and consistency with UNFCCC/IPCC guidance and guidelines	Whole process designed taking into account the IPCC guidelines	

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen strong and significant improvements and is now (green).

Subcomponent 4a: National Forest Monitoring System

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
29	Documentation of monitoring approach	National monitoring system consistent with international and national standards. However, in the process of revision and has not yet been approved Uncertainties are quantified of both AD, LULC map, emission factors	Operationalizing the system needs to be initiated to discover and solve bugs in the systems
30	Demonstration of early system implementation	There is Inter-institutional coordination;	There is a need to increase institutional, technical and coordination capacity. There is a need to further strengthen and improve flexibility in coordination There is a need to integrate the permanent parcels.

31	Institutional arrangements and capacities	Clear mandates: FNDS-UTREDD +; DINAF; IIAM; EMU There are web pages that share information Resource needs identified	There is a need to define a mechanism that facilitates the sharing of information / Data Resources must be acquired and made operational

General Comments:

Both stakeholders and the Mozambique government concur that this thematic area has seen improvements, but that more work needs to be done on working out technical details and initiating testing of the systems in practice. (yellow).

Subcomponent 4b: Information system on multiple benefits, other impacts, governance, and safeguards

No.	Criteria	Strengths/ Weaknesses	Activities to be conducted
32	Identification of relevant noncarbon aspects and social and environmental issues	These have been identified in the SESA and the REDD+ Strategy	There is still the need for more divulging of these instruments to make them more effective.
33	Monitoring, reporting and information sharing	Safeguards Instruments Exist The channels for disseminating information have already been defined. In the day to day the information will be transmitted to the local communities.	There are tools in the design phase: 1-Information system; 2-Operational Safeguards Manual The information will also be disseminated through discussion forums or other regular meetings There is a need to increase significantly the communication mechanisms with local communities that have limited educational backgrounds as well as limited access to technology.
34	Institutional arrangements and capacities	Well defined	

General Comments:

While some stakeholders classified this subcomponent as yellow, there was acknowledgement from these participants that this was a reflection of the early stages of Mozambique's implementation phase rather than the Readiness phase, partly due to the wording provided in the FCPF Readiness Framework questions.

As a result, the Mozambique government believes that this thematic area is indeed green when attention is focused on the Readiness stage, while recognizing the need for more work to be done.

.

At the same time it is recognized that technical documents about consultations still need to be translated into effective measures for communicating with local and community stakeholders without higher levels of academic training, and that the effectiveness of these measures can only be analyzed following their implementation.

5 Work Program to Consolidate the REDD+ Readiness Phase

Table 7: Work program to consolidate the REDD+ readiness phase between January - December 2017

Executive summary	Strategic Activities (AE)		Operational activity		Monthly Chronogram											
	Nr		Nr	Planning	J	F	M	A	M	J	J	A	S	O	N	D
	1	Support the initiative of revising the Forest Law in the context of the reform of the sector	A	Conduct workshops and public consultations												
			B	Consulting for national forest certification												
	2	Dissemination of the results of the forestry operators' monitoring activity	A	Hold National Forest Meeting												
	3	Strengthening forestry oversight	A	Elaboration of AQUA Operational strategy												
			B	Workshop on Harmonization of the AQUA Strategy												
			C	Hiring Consultant to train AQUA inspectors in Zambezia and Cabo Delgado Provinces												
	4	Reform of the forestry sector	A	Conduct economic and financial feasibility study of the Forestry Sector with focus on CD and Zambezia provinces (concessions / simple licenses);												
			B	Conduct a study on forest governance												
	1	Direct communication in communities	A	Disseminate REDD + safeguards and themes (ESMF, RPF; *Grievance Mechanism)* via community theater, lectures and IEC material.												

	2	Material IEC	A	Produce IEC material, incl. simplified versions of technical documents														
	3	Engagement with the media	A	Conduct field visits with journalists and Consultation on access to information and understanding on REDD + with journalists														
	4	TV Vignettes	A	Designing stickers														
			B	Insert stickers on TV														
	5	Participation in business and technology fairs	A	Participate in FACIM, Participate in the agricultural and technological fair of Cabo-Delgado and Zambézia and round tables														
	6	Media Guide	A	Conceive media guide														
			B	Make and reproduce and distribute														
	7	REDD + dissemination through digital platforms	A	Ensure updating of site, facebook, blog and twitter														
	1	Prepare the safeguards instruments	A	Prepare Safeguards documents (SESA, RPF, ESMF and PF)														
			B	Disseminate and train on the safeguards instruments (ESMF, RPF; *Grievance Mechanism)*														
	2	Preparation of the Safeguards Information System	A	Hold seminars on indicators in the framework of REDD + (definition of safeguards indicators)														
			B	Identify, prepare / train groups for the collection and submission of information, including CGRN (Safeguards + MRV)														
				Collect information on safeguards (Baseline elaboration and indicators reports) (Safeguards + MRV)														
			C	Preparing the Framework for MozFP / DGM														
	3	Implementation of *Grievance Mechanism*	A	Create system for submitting complaints online														
			B	Define community prioritization map and model to start the auscultation process														
			C	Hold periodic meetings for auscultation														
				Develop														

Establishment of FREL / FRL for Mozambique at the national level by Type of Vegetation, also allowing its calculation at provincial level, programs and projects	**1**	Analysis of activity data (area of changes in forest cover by deforestation, forest degradation, etc., for the chosen reference period.	A	Develop an updated land cover and land use map to assess the extent of forest cover (by types of vegetation) before starting REDD +													
				LU / LC base map validation workshop													
	2	Development of soil cover maps.	A	Develop an updated land cover and land use map to assess the extent of forest cover (by types of vegetation) before starting REDD +													
	3	Design and implementation of the National Inventory	A	LU / LC base map validation workshop													
	4	Improve tools and methodologies for estimating and monitoring carbon stocks.	A	LULC changes Analysis (2001-2016).													
	5	Development of emission reference levels	A														
	6	Establishment of permanent plots for MRV	A														
Operationalisation of the Forest Monitoring System; To design, implement and test a system of PMRV and SIS for the country considering 4 levels of application: (i) - National		Development of tools and methodologies for estimating carbon pools		For 2018													
		Development of National REDD+ Registry and harmonization with Forest information Platform	A	Consultant (FAO)													
	1	Preparation of MRV	A	Analysis of organizations and systems, needs assessment													
	2	Acquisition of equipment	A														

level, with a Remote Sensing / - REDD + to be integrated into the DIRN), (ii) Provincial Level (iii) Level of Districts (iv) Level of Communities	**3**	Hiring an IT expert in database management for two years until the end of 2018	A																	
	1	Monitoring of activities in the context of sustainable management initiatives	A	Elaborate the Plan of action for integrated sustainable management of the Zambezia program																
			B	Accompany other sustainable management initiatives at the level of the 7 districts of the REDD +																
	2	Community Support / NIPIODE Community Forest	A	Hire a consultant to train members of the community in Nipiode on sustainable management of forests (techniques of Charcoal production, control of fires)																
	3	Ensure a sustainable exploitation of the forest resources in the province of Zambezia	A	Operationalisation of pilot pilots in Zambezia																
	4	Training in conservation agriculture	A	Train 80 extensionists in conservation agriculture																
	5	Promote sustainable use of Biomass energy	A	Train producers of charcoal in techniques of more efficient and sustainable charcoal production for Biomass energy (Radeza).																

	6	Support the dissemination of legislation in the field of Sustainable Forest Management	A	Hold meetings for the dissemination of forestry legislation and standardization of Measurement and Cubing Methods.	
			B	Carry out training under the forest management plan to the concessionaires of simple licenses including members of AMAZA / AMOMA / APAMAZ	
	7	To contribute to the dissemination and sensitization on the conservation of the Gilé National Reserve	A	Preparation and dissemination of information material on the Gile reserve	
Promoting sustainable rural development through the conservation and preservation of natural resources	**1**	Capacity building for Integrated Sustainable Management of the Cabo Delgado and Zambezia Programs	A	Hire a Technical Assistant in the Area of Agriculture for Conservation and Management of Natural Resources and Forests	
			B	Hire an administrative assistant	
			C	Conduct the provincial integrated development Forums	
	2	Monitoring of activities in the context of sustainable management initiatives	A	To follow the CGRN training process at the level of the 7 districts of the REDD +	
			B	Create (includes legalize) and / or revitalize from CGRN;	
			C	Accompany other sustainable management initiatives at the level of the 7 districts of the REDD +	
	3	Dissemination of the REDD + studies for the Cabo Delgado program	A	Disseminate studies on QLI; Agricultural markets; Socio-economic under the REDD + program	
	4	Ensure a sustainable exploitation of forest resources in the province of Cabo Delgado	A	Carry out training under the forest management plan to the concessionaires of simple licenses including members of AMAZA / AMOMA / APAMAZ and hold meetings for the dissemination of forestry legislation and standardization Of Measurement and Cubing Methods.	

			B	Operationalisation of control pilot controls on CD													
	5	Promote conservation agriculture in the PNQ and buffer zone	A	Train extensionists in the field of conservation agriculture													
	6	Supporting the Nimala community in the area of sustainable natural resource management	A	Elaboration of business plans for Nimala community; Coordinate with Mozbio													
			B	Hire services for technical assistance for reforestation, horticulture, charcoal, etc.).													
	7	Support the reclassification of the PNQ	A	To prepare the ToR, to hire consultant, to make public consultations and the proposal of the reclassification.													
	8	Develop, implement and test benefit sharing mechanisms	A														
Guide for the effective implementation of REDD + in Mozambique	**1**	Elaboration / Review of the REDD + National Strategy	A	Carry out a sounding of the updated version of the National REDD +													
	2	Process for the approval of the REDD + National Strategy	A	Submit the National REDD + Strategy to the Economic Council of the Prime Minister's Office for appreciation and approval													
			B	Submit the National REDD + Strategy to the Council of Ministers for appreciation and approval													
	3	Desolation of the REDD + National Strategy	A	Disseminate the REDD + National Strategy													
Ensure the implementation of the Jurisdictional Programs	**1**	Inter-institutional co-ordination	A	Institutionalize the working relationships between the PMR and other state institutions in REDD+ program development, implementation, and supervision													
			A	Prepare the memorandum of understanding between UT-REDD + and MozBio, UEM, IIAM													
	2	Preparation of technical manuals for REDD +	A	Elaborate Terms of Reference													
			B	Elaborate the technical manual													
			C	Distribute from the Technical Manual													
	3	Monitoring and evaluation	A	Perform monthly monitoring and evaluation of the activity plan. Elaborate bimonthly reports													
	5	Regular meetings with CTR	A	Hold regular meetings with CTR													

6 Conclusion

Mozambique therefore believes that there is no longer any obstacle from this point forward to implementation of emission reduction programs remunerated by performance-based payments. This testing will also help finalize and/or adjust the national REDD+ infrastructure.

In addition, Mozambique is counting on support from members of the FCPF Participants Committee to validate this level of REDD+ readiness as acceptable for the consolidation of the REDD+ readiness process in Mozambique.

7 Bibliography

(2013). High- Resolution Global Maps of 21st- Century Forest Cover Change. Science, 342, 850- 53.

Assessment of Non-Timber and Non-Wood Forest Products Value Chain in the Zambezia, Nampula and Cabo Delgado Provinces, Mozambique" (2015)

Balderas Torres, A. (2014). Potential for integrating community- based monitoring into REDD+. Forests(5), 1815–1833.

Balderas Torres, A., Santos Acuña, L., & Canto Vergara, J. (2014). Integrating CBM into land- use based mitigation actions implemented by local communities. Forests(5), 3295–3326.

Bellfield, H., Sabogal, D., Mardas, N., Goodman, L., & Leggett, M. (2015). Community- based monitoring systems for REDD+: A case- study from Guyana. Forests(6), 133–156.

Boissière, M., Beaudoin, G., Hofstee, C., & Rafanoharana, S. (2014). Participating in REDD+ measurement, reporting, and verification (PMRV): Opportunities for local people? Forests(5), 1855–1878.

Boissière, M., Felker, L., Depuy, W. H., Bong, I. W., Dharmadi Hawthorne, S., Ekowati, D., et al. (2014). Estimating carbon emissions for REDD+. The conditions for involving local people. Perspective(30), 1- 4.

Brofeldt, S., Theilade, I., Burgess, N., Danielsen, F., Poulsen, M., Adrian, T., et al. (2014). Community monitoring of carbon stocks for REDD+:Does accuracy and cost change over time? Forests(5), 1834–1854.

CEAGRE, & Winrock International. (2016). Agentes e causas de desmatamento e degradação florestal em Moçambique.Maputo, Moçambique.

Chave, J., Andalo, C., Brown, S., Cairns, M., Chambers, J., Eamus, D., et al. (2005). Tree allometry and improved estimation of carbon stocks and balance in tropical forests. Oecologia(145), 87- 99.

Chhatre, A., & Agrawal, A. (2009). Trade- offs and synergies between carbon storage and livelihood benefits from forest commons. Proceedings of the National Academy of Sciences of the United States, 106(42), 17667-17670.

Climate Change and Forest Resilience, IIED, 2006

Combining Satellite Data and Community- Based Observations for Forest Monitoring. Forests(5), 2464- 2489.

Constantino, P., Carlos, H., Ramalho, E., Rostant, L., Marinelli, C., Teles, D., et al. (2012). Empowering local people through communitybased resource monitoring: A comparison of Brazil and Namibia. Ecology and Society, 17(4).

Cuambe, C. (2008). Woodfuels Integrated Supply Demand Overview Mapping (WISDOM) for Mozambique. Conference on charcoal and communities in Africa, (pp. 77-100). Maputo.

Direcção Nacional de Terras e Florestas. (2009). Estratégia para o Reflorestamento. Maputo: Ministério da Agricultura.

DNTF. (2014). Relatório anual de terras, florestas e fauna bravia. Maputo, Moçambique: Direcção Nacional de Terras e Florestas.

DNTF. (2015). Relatório anual de terras, florestas e fauna bravia. Maputo, Moçambique: Direcção Nacional de Terras e Florestas.

DNV.GL. (2015). Developing a Reference Level and designing a MRV system for a REDD+ program in Oromia Regional State – Draft Technical Report. DNV.GL.

Egas, A. (2006). Comparação de custos de consumo de lenha e carvão com outras fontes de energia domésticas na confecção de refeições. Resumo de iniciativas de gestão de resursos naturais implementadas em 2003-2005 (pp. 102-103). Maputo, Moçambique: IUCN.

Egas, A. (2013). Assessment of harvested volume and illegal logging in Mozambican natural forest. Maputo, Moçambique: Universidade Eduardo Mondlane.

EIA. (2013). First class connections: log smuggling, illegal logging, and corruption in Mozambique.Environmental Investigation Agency, UK.

Evans, K., & Guariguata, M. (2008). Participatory monitoring in tropical forest management: A review of tools, concepts and lessons learned. Bogor, Indonesia: Center for International Forestry Research.

Falcão, M., Bila, A., & Remane, I. (2015). Avaliação das perdas de receitas devido a exploração e comércio ilegal de madeira em Moçambique no período 2003-2013.Maputo, Moçambique: WWF Moçambique.

FCPF (2013) A Guide to the FCPF Readiness Assessment Framework

Garcia, C., & Lescuyer, G. (2008). Monitoring,indicators and community based forest management in the tropics: Pretexts or red herrings? Biodiversity and Conservation, 17(6), 1303- 1317.

German, L., & Wertz-Kanounnikoff, S. (2012). Sini-Mozambican relations and their implications for forests: a preliminary assessment of the case of Mozambique.Bogor, Indonesia: CIFOR.

Governo de Moçambique. (2004). Constituição da República de Moçambique. Maputo: Assembleia da República, 16 de Novembro de 2004.

Governo de Moçambique. (2011). Plano estratégico para o desenvolvimento do sector agrário 2011- 2020. Maputo: Ministério da Agricultura.

Governo de Moçambique. (2012). Estratégia Nacional de Adaptação e Mitigação das Mudanças Climáticas. Maputo: MICOA.

Governo de Moçambique. (2015). Estratégia Nacional de Desenvolvimento Sustentável. Maputo MITADER.

Governo de Moçambique. (2015). Plano Quinquenal do Governo 2015-2019. Maputo: Conselho de Ministros, 4a Sessão Ordinária, 17 de Fevereiro 2015.

Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A., et al.

Hansen, M. C., V., P. P., R., M., Hancher, M., A., T. S., & A., T. (2013). High-resolution global maps of 21-st century forest cover change. Science, 850-853. IPCC. (2014). Climate Change 2014: Synthesis report. Painel Intergovernamentalsobre as Mudanças Climáticas. Genebra, Suiça.

Hawthorne, S., & Boissière, M. (2014). Literature review of participatory measurement, reporting and verification (PMRV). Bogor. Indonesia: Center for International Forestry Research.

Lawrence, A., Paudel, K., Barnes, R., & Malla, Y. (2006). Adaptive value of participatory biodiversity monitoring in community forestry. Environmental Conservation, 33(4), 325- 334.

Maplecroft. (2015). Maplecroft. Obtido de Climate change vulnerability index.: https://maplecroft.com/about/news/ccvi.html

Marzoli, A. (2007). Relatório do inventário florestal nacional. Maputo, Moçambique: Direcção Nacional de Terras e Florestas.

MICOA. (2012). Relatório nacional de emissões de gases de efeito de estufa. Maputo: Ministério para a Coordenação da Acção Ambiental.

MINAG. (2009). Estratégia nacional de reflorestamento. Maputo, Moçambique: Ministério da Agricultura.

MINAG. (2010). Plano estratégico para o desenvolvimento do sector agrário 2010-2019. Maputo, Moçambique.

Ministério da Energia. (2013). Estratégia de conservação e uso sustentável da energia da biomassa. Maputo: Ministério da Energia.

Ministério de Energia. (2013). Mozambique biomass energy strategy. Maputo, Moçambique.

Morecambe, Lancs., UK: Sustainable Livelihood Action - Utviklingsfondet / The Development Fund of Norway.

Mukama, K., Mustalahti, I., & Zahabu, E. (2012). Participatory forest carbon assessment and

Nemus/Beta. (2015). Análise do quadro legal e institucional para implementação do REDD+ em Moçambique. Relatório Final. Maputo, Moçambique: FUNAB.

Nhantumbo, I. (2016). Relatório do projecto TREDD - Avaliação dos modelos de redução de desmatamento e degradação florestal. Londres: IIED.

Paneque- Gálvez, J., McCall, M., Napoletano, B., Wich, S., & Koh, L. (2014). Small drones for community-based forest monitoring: An assessment of their feasibility and potential in tropical areas. Forests(5), 1481–1507.

Porter- Bolland, L., Ellis, E., Guariguata, M., Ruiz- Mallen, I., Negrete- Yankelevich, S., et al. (2012). Community managed forests and forest protected areas: An assessment of their conservation effectiveness across the tropics. Forest Ecology and Management(268), 6- 17.

Pratihast, A., DeVries, B., Avitabile, V., de Bruin, S., Kooistra, L., Tekle, M., et al. (2014).

REDD+: learning from Tanzania. International Journal of Forestry Research, Article ID 126454.

República de Moçambique. (2014). Estatuto orgânico da Administração Nacional das Áreas de Conservação. Boletim da República, I Séria Nr 48, Resolução nº8/2014, pp. 1281-1285.

República de Moçambique. (2014). Política de áreas de conservação. Boletim da República, I Série Nr 50, Lei nº 16/2014, pp. 1297-1308.

República de Moçambique. (2016). Plano de Acção da Estratégia de REDD+ 2016

República de Moçambique. (2016). Estratégia Nacional de REDD+ 2016-2025.

Ribeiro, D., & Nhabanga, E. (2009). Levantamento Preliminar da Problemática das Florestas de Cabo Delgado.Maputo: Justiça Ambiental, Maputo, Moçambique.

Scott Wilson. (2016). Environmental and Social Management Framework (ESMF) for REDD+. Maputo, Moçambique.

Scott Wilson. (2016). Strategic Environmental and Social Assessment (SESA). Relatório V3. Maputo, Moçambique.

Shrestha, S., Karky, B., & Karki, S. (2014). Case study report: REDD+ pilot project in community forests in three watersheds of Nepal. Forests(5), 2425–2439.

Skutsch, M., Turnhout, E., Vijge, M., Herold, M., Wits, T., den Besten, J., et al. (2014). Options for a national framework for benefit distribution and their relation to communitybased and national REDD+ monitoring. Forests(5), 1596–1617.

Skutsch, M., van Laake, P., Zahabu, E., Karky, B., & Phartiyal, P. (2009). Community monitoring in REDD+. In Angelsen, A.,Brockhaus, M., Kanninen, M., Sills, E., Sunderlin, WD. and

Stuart- Hill, G., Diggle, R., Munali, B., Tagg, J., & Ward, D. (2006). The event book system:community- based monitoring in Namibia. Participatory Learning and Action(55), 70- 78.

Sutcliffe, J. (2015). Community- Based Measurement, Reporting and Verification System.

Topp- Jorgensen, E., Poulsen, M., Lund, J., & Massao, J. (2005). Community- based monitoring of natural resource use and forest quality in montane forests and miombo woodlands of Tanzania. Biodiversity and Conservation, 14(11), 2653- 2677.

Unique. (2016). Melhoria do clima de investimentos no sector de plantações florestais em Moçambique. Maputo, Moçambique: Banco Mundial.

Wertz- Kanounnikoff, S. Realising REDD+: National strategy and policy options. Bogor. Indonesia: Center for International Forestry Research.

Zambezia Integrated Landscape Management Program, EtcTerra (2016)

8 Annexes

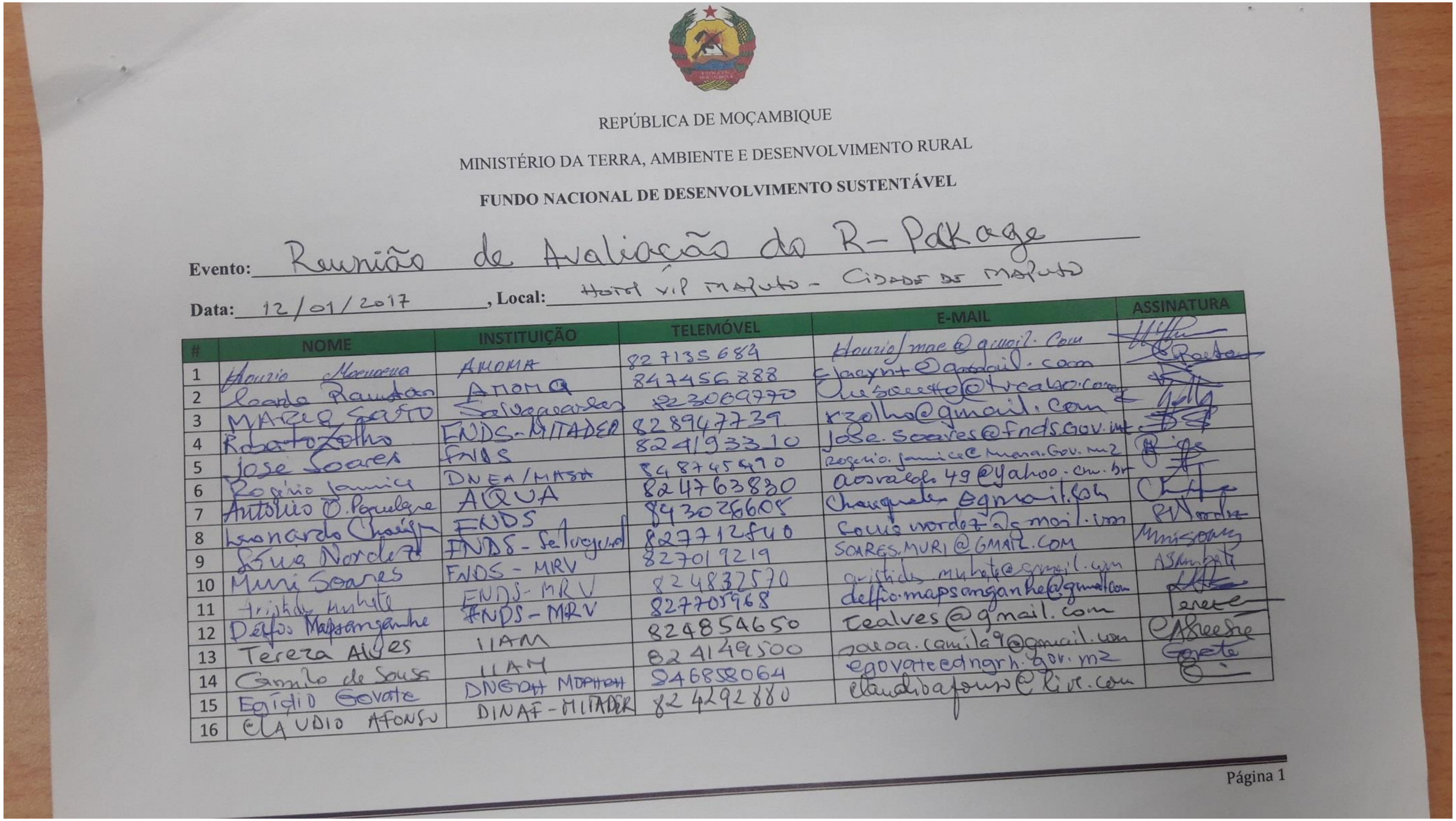
Public Consultations

			PARTICIPAÇÃO		
Evento	**Local**	**Data**	**Homens**	**Mulheres**	**Total**
Nível Central					
Consulta Pública sobre o Decreto do REDD+	Maputo	03.06.2013	25	39	64
Reunião do Plano de Implementação do Decreto REDD+	Maputo	01-04.04.2014	5	7	12
Reunião de Preparação do Material Informativo	Maputo	28.10.2014	28	13	41
Reunião de Progresso de Preparação do Material IEC	Maputo	27.10.2014	5	2	7
Consultas Pública sobre Definição de Florestas	Maputo	17.03.2015	21	8	29
Primeiro Workshop de Harmonização da EN-REDD+	Maputo	11.06.2015	22	9	31
Reunião de Lançamento da Elaboração da EN-REDD+	Maputo	12.06.2015	7	8	15
Workshop com a Comunicação Social	Maputo	30.06.2015	15	2	17
Workshop com o Conselho Técnico de Revisão do REDD+	Maputo	08.07.2015	11	4	15
Segundo workshop de Harmonização da EN-REDD+	Maputo	15.07.2015	14	10	24
Workshop sobe Visão e Missão da EN-REDD+	Maputo	28.07.2015	37	20	57
Workshop Internacional sobre Gestão Integrada de Paisagens	Maputo	20-22.07.2015	93	61	154
Workshop sobre Potencial de Redução de Emissões_EN-REDD+	Maputo	18.08.2015	34	27	61
Workshop do Plano de Acção da EN-REDD+	Maputo	15.10.2015	20	12	32
Consulta Pública sobre o Plano de FIP e EN-REDD+	Maputo	09.03.2016	27	24	51
Reunião de Discussão dos Indicadores das salvaguardas	Maputo	18.11.2016	13	12	25
Consulta Pública Nacional sobre DGM	Maputo	30.09.2015	19	10	29
Primeira Reunião do GT-DGM	Maputo	05.11.2015	21	6	27
Quarta reunião do GT-DGM	Maputo	13.10.2016	14	4	18
Reunião de Lançamento do Estudo sobre o Quadro Legal e Institucional	Maputo	01.06.2015	19	14	33
Consulta Pública sobre o Plano de Investimento Florestal	Online	24.02-29.03.2016	33	4	37
Reunião com o Conselho Técnico de Revisão do REDD+	Namaacha-Maputo	11-12.08.2016	12	20	32

Reunião de Establecimento do Comité Nacional de Gestão do FIP	Maputo	12.11.2015	10	6	16
Segunda Reunião do Comité de Gestão do FIP	Maputo	01.03.2016	17	8	25
Reuniaõ sobre Integração de Gênero na Gestão dos R. Naturais	Maputo	14.10.2016	16	27	43
Workshop de Discussão das Notas Técnicas do MozFIP	Maputo	25-26.08.2016	15	5	20
Terceira Reunião do Comité de Gestão do FIP	Maputo	14.10.2016	27	17	44
			580	**379**	**959**
Nível Provincial					
Consulta Pública sobre o Decreto do REDD+	Beira-Sofala	04.06.2013	32	11	43
Consulta Pública sobre o Decreto do REDD+	Nampula-Nampula	06.06.2013	26	13	39
Consulta Pública sobre Definição de Florestas	Pemba-Cabo Delgado	07.11.2014	26	6	32
Consulta pública sobre Definição de Florestas	Beira-Sofala	19.11.2014	52	19	71
Consulta Pública Regional Centro sobre DGM	Quelimane-Zambézia	15.09.2015	58	24	82
Consulta Pública Regional Norte sobre DGM	Nampula	23.09.2016	36	3	39
Consulta Pública Regional Sul sobre DGM	Xai-Xai - Gaza	22.10.2015	62	56	118
Lançamento: Instrumentos de salvagauardas na Zambézia	Quelimane-Zambézia	15.05.2015	32	9	41
Lançamento: Instrumentos de salvagauardas Cabo Delgado	Pemba - Cabo Delgado	08.05.2015	13	6	19
Consulta pública regional sul sobre REDD+ e FIP	Xai-Xai - Gaza	25.08.2015	67	28	95
Consulta pública regional centro sobre REDD+ e FIP	Quelimane-Zambézia	14.09.2015	197	33	230
Consulta Pública Regional Norte sobre REDD+ e FIP	Nampula-Nampula	22.09.2015	111	13	124
Capacitação de Operadores e Técnicos Florestais	Montepuez - C Delgado	09-10.11.2016	50	8	58
Primeiro Fórum Provincial do REDD+ Zambézia	Quelimane-Zambézia	07.08.2015	56	21	77
Segunda Reunião do GT-DGM	Pemba-Cabo-Delgado	30-31.03.2016	18	6	24
Terceira Reuniao do GT-DGM	Quelinane-Zambézia	30.06 - 01.07.2016	33	14	47
Conferência sobre Gestão da Reserva Nacional do Gilé	Pebane-Zambézia	06-07.01.2016	114	19	133
Terceiro Fórum Provincial do REDD+ Zambézia	Quelimane-Zambézia	09.02.2016	54	12	66
Quarto Fórum Provincial do REDD+ Zambézia	Quelimane-Zambézia	20-21.04.2016	73	13	86
Primeiro Fórum da Plataforma da da Zambézia	Quelimane-Zambézia	30.06.2016	33	14	47
Primeiro Fórum Provicial do REDD+ Cabo Delgado	Pemba-Cabo Delgado	04.08.2015	33	3	36

Missão a Cabo Delgado (Terceiro Fórum Provincial Cabo Delgado)	Cabo Delgado	20-24.11.2015	32	8	40
Segundo Fórum Provincial do REDD+ Cabo-Delgado	Pemba-Cabo Delgado		22	7	29
Capacitação de extensionistas rurais sobre redução de desmatamento	Cabo Delgado	22-28.11.2016	32	5	37
Quarto Fórum Provincial do REDD+ Cabo Delgado	Pemba-Cabo Delgado	12-13.04.2016	31	5	36
			1293	**356**	**1649**
Nível das Comunidades					
Consulta: Salvaguardas e engajamento das comunidades	Namarrua - Gilé -Zambézia	12.05.2016	94	23	117
Consulta: Salvaguardas e engajamento das comunidades	Musseia - Pebane- Zambézia	11.05.2016	53	17	70
Consulta: Salvaguardas e engajamento das comunidades	Nacoja - Quissanga - Cabo Delgado	04.05.2016	92	86	178
Consulta: Salvaguardas e engajamento das comunidades	Bangala II - Macomia - Cabo Delgado	05.05.2016	41	20	61
Consulta: Salvaguardas e engajamento das comunidades	Massasse&Nguya -Meluco-C. Degado	06.05.2015	55	23	78
Consulta: Salvaguardas e engajamento das comunidades	Montepuez - Quissanga - C Delgado	04.05.2016	80	21	101
Consulta: Salvaguardas e engajamento das comunidades	Chaves - Gaza	27.08.2015	27	22	49
Consulta: Salvaguardas e engajamento das comunidades	Mavumbuque-Mabalane-Gaza	26.08.2015	36	17	53
Reunião para Eleição dos Representantes das Comunidades no DGM	Macubela - Zambézia	31.08.2016	45	6	51
Eleição do membro da comunidade de Gilé para o DGM	Gilé-Zambézia	25.11.2016	35	8	43
Reunião para Eleição dos Representantes das Comunidades no DGM	Cabo Delgado	22.09.2016	28	13	41
			586	**256**	**842**
			2459	**991**	**3450**

R-Package self-assessment participants list



REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL

FUNDO NACIONAL DE DESENVOLVIMENTO SUSTENTÁVEL

Evento: Reunião de Avaliação do R-Pakage

Data: 12/01/2017, **Local:** Hotel vip Maputo - Cidade de Maputo

#	NOME	INSTITUIÇÃO	TELEMÓVEL	E-MAIL	ASSINATURA
1	Houzio Macuácua	AMOMA	827135684	Houziofmac@gmail.com	[illegible]
2	Ricardo Ramtão	AMOMA	847456888	Ejacynt@gmail.com	[illegible]
3	MARIA SANTO	Salvaguardas	823069770	Luesousa@hotmail.com	[illegible]
4	Roberto Zolho	FNDS-MITADER	828947739	rzolho@gmail.com	[illegible]
5	Jose Soares	FNDS	824193310	jose.soares@fnds.gov.mz	[illegible]
6	Rogério Jamice	DNEA/MASA	848745490	rogerio.jamice@masa.gov.mz	[illegible]
7	António O. Paquelane	AQUA	824763830	aosvalele49@yahoo.com.br	[illegible]
8	Leonardo Chaúque	FNDS	843026605	Chauquele@gmail.com	[illegible]
9	Sónia Nordez	FNDS - Salvaguardas	827712540	sonianordez@gmail.com	[illegible]
10	Muri Soares	FNDS - MRV	827019219	SOARES.MURI@GMAIL.COM	[illegible]
11	Aristides Muhate	FNDS-MRV	824832570	aristides.muhate@gmail.com	[illegible]
12	Delfio Mapsanganhe	FNDS - MRV	827705968	delfio.mapsanganhe@gmail.com	[illegible]
13	Tereza Alves	IIAM	824854650	tealves@gmail.com	[illegible]
14	Camilo de Sousa	IIAM	824149500	sousa.camilo9@gmail.com	[illegible]
15	Egídio Govate	DNGRH MOPHRH	846858064	egovate@dngrh.gov.mz	[illegible]
16	CLAUDIO AFONSO	DINAF - MITADER	824292880	claudioafonso@live.com	[illegible]

Página 1

#	NOME	INSTITUIÇÃO	TELEMÓVEL	E-MAIL	ASSINATURA
17	Manuel Monteiro	DINAS/MASA	827013794	manoelmonteiro946@	[illegible]
18	[illegible] Habiba	Cislamo	822382610	yahoo.com.br	[illegible]
19	Pedro Phiri	DPPRN[illegible]	823827395	pedrophiri64@gmail.com	[illegible]
20	Hilario Aiuissa	DINAF	827971520	hilario.ndyamBwana@yahoo.com	[illegible]
21	Roselda Sousa	DINAS/MASA	844126980	roseldasousa@gmail.com	Roselda
22	Ofelia Simão	MEEF/DEEF	823933951	ossimao@yahoo.com.br	OSS
23	TEODORO C. VALES	MAEFP	820190754	TEOVALES@YAHOO.CO.UK	[illegible]
24	IVONE SEMENTE	FNDS	84-3749310	ismavamgo@gmail.com	[illegible]
25	Sean Nazerali	Consultor - FNDS	840135594	sean.nazerali@gmail.com	[illegible]
26	Virgilho Antonio Fumo	MIC/DNI	824629080	virgilhofumo@yahoo.com.br	[illegible]
27	Regina Cruz	FNDS	828435350	regina.cruz@fnds.gov.mz	[illegible]
28	RENATO TIMANE	DINAF	823150390	renatotimane@yahoo.com	[illegible]
29	Sheila Majibbe	FUNAE	845084074	sheilamajibbe@funae.co.mz	Sheila
30	Claudia [illegible]	FNDS	84-3823515	claudiamatalia@yahoo.com.br	[illegible]
31	Tânia Chicane	FNDS	844473321	taniachicane@gmail.com	[illegible]
32	Edmir Augusto	FNDS	829244190	edmirmonteiroaugusto@gmail.com	Edmir
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					