



## 5.1 TLAS and REDD+ measurement, reporting and verification in DRC

VALÉRIE MERCKX, SEBASTIAN SCHRADER,  
MICHAEL OBERSTEINER, LEO BOTTRILL  
and CARLOS RIANO PARAMO

The successful implementation of a results-based payment scheme such as REDD+ depends on the credible measurement and reporting of performance. Likewise, successful implementation of FLEGT Voluntary Partnership Agreements (VPAs) relies on transparent, credible and robust means to ensure that timber products are produced and traded legally.

In the case of REDD+, countries need to develop a National Forest Monitoring System (NFMS) to monitor and report the outcomes of their efforts to reduce forest-related greenhouse gas (GHG) emissions.<sup>1</sup> Emissions are measured according to how much they deviate from a reference level; a reference level provides a business-as-usual scenario against which actual emissions can be compared.

Under the UN-REDD approach,<sup>2</sup> an NFMS provides a monitoring function and a Measurement, Reporting and Verification (MRV) function. The monitoring function of the NFMS is primarily a domestic tool; it allows a country to assess a broad range of forest information, including in the context of REDD+. The MRV function for REDD+, on the other hand, refers to the estimation and international reporting of national-scale forest emissions and removals. Developing a Monitoring and Measurement, Reporting and Verification (M&MRV) system and ensuring its sustainability over time is one of the components of the REDD+ readiness process.



OPPORTUNITIES FOR SYNERGIES  
BETWEEN THE TLAS AND MRV  
SYSTEMS WILL BECOME APPARENT  
AS THEIR DESIGN AND  
IMPLEMENTATION PROGRESS.

Two sets of information are required to estimate forest-related GHG emissions:<sup>3</sup>

- activity data: areas under various categories of land use<sup>4</sup> and their evolution over time (for example, forest land being converted to cropland, grassland converted to forest); and
- emission factors: information on carbon stocks per unit of area for relevant categories of land use and on carbon stock changes over time.

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**Valérie Merckx** and **Sebastian Schrader** work for the EU REDD Facility, EFI, Barcelona; **Michael Obersteiner** and **Leo Bottrill** are consultants with IIASA-ESM, Laxenburg, Austria; and **Carlos Riano Paramo** is Technical Adviser, TerraCongo Project, Kinshasa, DRC.

Monitoring activity data requires observations of historical trends and current changes in forest cover through satellite images, validated by “ground truthing” (field data) of the satellite data. Since satellite imagery from optical sensors cannot measure forest carbon directly, measuring emissions requires field-based carbon stock estimates or remote sensing approaches such as radar or optical instruments (e.g., Laser Imaging Detection and Ranging, or LIDAR) to map carbon stocks in the vegetation and their changes.

According to the UNFCCC,<sup>5</sup> countries are required to develop national monitoring systems that use a combination of remote sensing and ground-based forest carbon inventory approaches. They also need to provide estimates that are transparent, consistent and as accurate as possible, taking into account national capabilities and capacities.

In the case of FLEGT, countries develop a Timber Legality Assurance System (TLAS) to provide a credible and robust means to ensure that timber products were produced legally. FLEGT licences are issued for legally produced forest products by the Partner Country. This requires a system that includes checks of forest operations and control of the supply chain, from harvesting to the point of export or domestic use. A TLAS consists of five strongly interconnected components.

First, a national timber legality definition (LD) sets out clearly which laws of the Partner Country must be met and provides criteria and indicators with which to test compliance with these laws. The LD focuses on specific laws that address key issues of illegal logging and the three pillars of sustainability: economic, environmental and social objectives. Selecting these laws is the result of in-country dialogue and interests among various national stakeholders.

Second, a Supply Chain Control system ensures that the origin of wood products covered by the TLAS can be established throughout the production chain, from harvesting to the point of export or domestic use. A supply chain control system at the national level will make available comprehensive, systematically collected and regularly updated data such as this:

- extent of clearly delineated areas with allocated forest resource rights;
- volume of standing timber, and felled and extracted timber; and
- volume of temporarily stored, processed, exported or locally consumed timber.

Third, a Verification System sets out mechanisms to verify compliance with both the legality definition and control of the supply chain. The verification methodology is documented and ensures that the process is systematic, transparent and evidence-based, and is carried out at regular intervals. It also provides for addressing non-compliance.

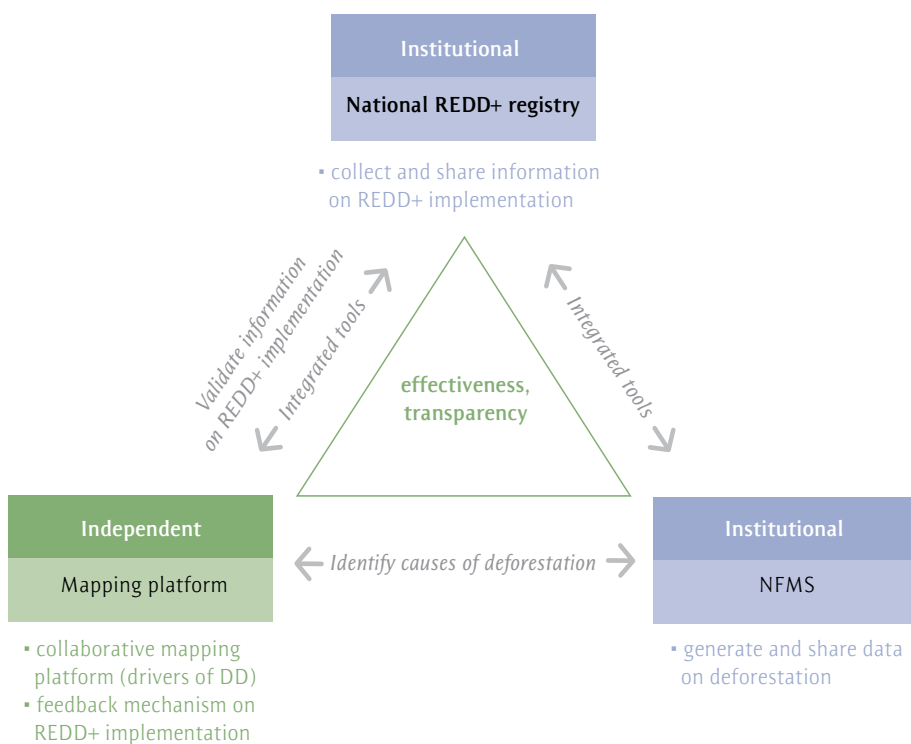
Fourth, a Licensing System describes how the data generated through the Verification System informs the licensing authority as to whether to issue a licence, and how this will be done.

Fifth, an Independent Audit of the system by a third party provides credibility by ensuring that all requirements of the TLAS are being implemented as prescribed.

## Developing the REDD+ monitoring system and TLAS in DRC

The REDD+ monitoring system being developed in the Democratic Republic of Congo (DRC) has three components: the National Forest Monitoring System (*Le Système National de Surveillance des Forêts*); the National REDD+ registry (*Le Registre National REDD+*); and the independent Moabi monitoring system (Figure 1). Each of these three components will be accessible through the internet, providing access to the information contained in the system to as many people as possible. The use of cell phone technology is foreseen to facilitate the exchange of information among local, national and international levels.

**Figure 1. Web-based platforms for effectiveness and transparency of REDD+ in DRC**



### *The National Forest Monitoring System*

The National Forest Monitoring System (NFMS)<sup>6</sup> is designed to observe actions and measures put in place to implement DRC's national REDD+ policy. It includes a satellite land monitoring system named TerraCongo, which is implemented by a team of experts from FAO and Brazil's *Instituto Nacional de Pesquisas Espaciais* (INPE). It includes GIS and image analysis capacities, database management functions and data access. This allows users to link biometric and tree-related parameters with indicators such as forest area, type of ecosystem, protected forest area, participation of indigenous peoples and stakeholders. It will allow every DRC citizen (or every final user) to check on deforestation online and to report online whether the data and its interpretation are correct, thereby increasing the transparency and ownership of REDD+ policies at the field level.

The system is designed to incorporate existing monitoring systems or elements of them, and can be combined with newly developed systems such as TLAS. The NFMS will be used by DRC to monitor and report on results obtained by REDD+ demonstration activities, the implementation of REDD+ policies and measures, and result-based activities. Data compilation and training are ongoing, as is system improvement. The transfer of the system to technical divisions of the Ministry of Environment, Nature Conservation and Tourism (*Ministère de l'Environnement, de la Conservation de la Nature et du Tourisme/MECNT*) is planned for late 2013.

### *The national REDD+ registry*

The national REDD+ registry, established through Ministerial Decree,<sup>7</sup> makes official the procedure for the registration and authorization of REDD+ projects. Currently under development by the *Observatoire des Forêts d'Afrique Centrale* (OFAC), the registry will centralize information related to the implementation of REDD+ in the country. Managed by the MECNT and accessible on line, the registry will make it possible to follow public and private funding for REDD+ and the results of such funding. In particular, it will allow users to follow impacts on local communities and estimate REDD+ contributions to economic growth.

The National REDD+ registry will be coupled with the NFMS, making it possible for all stakeholders to see REDD+ intervention areas and have access to deforestation statistics within project boundaries. The registry is also the main tool for the approval process of REDD+ projects, notifying REDD+ project developers of the information required at various phases of the agreement procedure (and the renewal of it).

### *Moabi RDC*

Moabi RDC is an independent collaborative mapping platform to share, improve and discuss spatial information related to REDD+ in DRC. It provides an independent forum for observing the impacts of REDD+ at both the local and national level. It has two main objectives:

- independent monitoring of REDD+ environmental and social safeguard implementation on the ground; and
- collection and consolidation of information on drivers of deforestation and forest degradation.

Moabi was initiated by WWF and is currently implemented by the International Institute for Applied Systems and Analysis (IIASA) through a consortium of DRC-based organizations, led by *Observatoire Satellital des Forêts* (OSFAC) and *Observatoire de la Gouvernance Forestière* (OGF). OGF is a local independent forest-monitoring NGO whose primary aim is to develop and conduct monitoring activities on forest management and exploitation. Moabi integrates an online map with a network that allows users to create profiles, add their own spatial data, edit information, post on discussion forums and contact other users. It provides access to a wide variety of national data on subjects such as mining and logging permits and road projects. This data is provided through various organizations,

including government ministries, national and international civil society groups, and research institutions. These users contribute geographic and other complementary information. It is the largest publicly accessible spatial database on drivers of deforestation in DRC. The data has identified more than 300 competing land uses such as forest concessions, mining or oil exploration areas, and protected areas that partly or fully overlap REDD+ pilot project areas.

In Moabi's second phase, it will further support monitoring REDD+ implementation at the local, national and international level. It has been proposed as one of the possible channels for the REDD+ grievance mechanism. On the ground, a planned cell phone and smart phone application will facilitate the collection of monitoring data directly from REDD+ project locations.

Data will include local community comments and grievances, socio-environmental safeguard implementation, and local information on subjects such as illegal logging. These tools will aid in the independent verification and documentation of information provided by project developers to the national REDD+ registry. They will also support the formation of a national information network of civil society groups in all regions of the country, including all REDD+ project intervention areas. This will expand the existing consortium of data providers, so that Moabi can build information on deforestation dynamics at various scales.

With the exception of the supply chain control system (see next paragraph), the TLAS in DRC is still in the development stage. Draft Legality Definitions (LDs) have been completed for industrial concessions and artisanal permits. These are being translated into a practical and efficient Verification System by the VPA Technical Committee under the MECNT. The committee includes representatives of government agencies, civil society and the private sector.

Development of a national supply chain control system has been concluded by *Société Générale de Surveillance SA* (SGS) and MECNT in 2012 under the Programme for Control of Wood Production and Commercialisation (PCPCB). It is based on the online database application SIGEF (Forest Information and Management System), which features specific user interfaces for the various involved parties.

Since early 2013, forest operators have had to make mandatory declarations of their current stocks. These are complemented by inspections and reconciliations by SGS and the Department for Internal Supervision and Verification (DCVI) at selected control points in the Kinshasa area. Mandatory quarterly declarations of inventory and production data, as well as decentralized inspections, will gradually be phased in. The supply chain control system is gradually becoming operational, despite remaining issues with system design and enforcement. The availability and reliability of forest industry data is expected to improve significantly over time.



Harnessing the LDs, supply chain control system and Verification System in a coordinated national TLAS system that is capable of issuing credible FLEGT licences, managing non-compliance and improving overall transparency are the major remaining tasks of the VPA negotiation and implementation process.

### How can MRV and TLAS benefit from each other?

The MRV and TLAS being developed for the DRC will both collect, organize and generate geo-referenced information related to forest-cover, forest areas, trees and species and forest management.

The two systems can be synergistic in several ways:

- Collection of information and quality control through, for example, remote sensing, can help detect, localize, describe and monitor large-scale forest exploitation, whether legal or illegal, across the entire country. Geo-referenced management data collected through the TLAS system, such as estimation of the standing and harvested volume of wood originated from a particular area, as well as species information, can be used to support cross-check estimates of area-specific emission factors, eventually allowing for the development of Tier 2 and 3 emission estimates<sup>8</sup> of both deforestation and degradation processes.
- Coordinated IT infrastructure and data management systems will likely benefit from the progress achieved in building the MRV and TLAS, which will lead to economy of scale and scope.
- MRV and TLAS can coordinate the identification of illegal logging hot spots, and the design and implementation of intervention strategies to control forest exploitation and reduce illegal activities.
- Improved data for forest management and policy planning, including improved spatial planning, will help target policies more precisely and increase their effectiveness.

The development of DRC's MRV system has already started. The development of the country's TLAS is still at an early stage, and will benefit from the experience acquired through the PCPCB project run by SGS and DCVI since 2009. It is expected that more opportunities for synergies between the two monitoring systems will become apparent as their design and implementation progress.

At this stage, two areas appear promising in terms of economies of scale and scope:

- the possibilities offered by the MRV system to refine the analysis and description of logging processes in the field; and
- a new phase of the development of the Moabi platform.

The MRV system makes it possible to better understand the issues at stake and inform the design of control strategies that will be put in place in the context of the TLAS. DRC's Ministry of Environment has expressed the need for the EU REDD Facility to engage in this issue, together with its directorate in charge of forest inventory and forest manage-

ment plans (*Direction de l'Inventaire et de l'Aménagement Forestier*, or DIAF) and with the TerraCongo team within the DIAF.

The new phase of the development of the Moabi platform started in 2013 with three aims:

- Strengthening civil society participation in REDD+ monitoring, land-use planning and mapping of informal and illegal land clearance. Moabi will work with field teams who are mapping community land tenure, such as Rainforest Alliance, WWF-DRC and the Woods Hole Research Center, to agree on data-sharing standards and to share mobile mapping technology. A registry of civil society organizations working on REDD+ in DRC will be developed and efforts to map informal and illegal clearance across multiple sectors (e.g., artisanal mining and logging) will be coordinated.
- Implementing continuous and regular REDD+ field monitoring through a collaborative mapping platform that is simple to use by those with little or no GIS experience, yet capable of responding to the needs of specialist users. Field monitors will also be able to validate land use and communicate potential violations using mobile tools.
- Improving deforestation baselines and REDD+ reference levels by providing additional social and economic data related to deforestation hot spots and sharing widely analytical products — including dynamic land-cover maps, agricultural suitability products and spatial predictions of REDD+ policy impacts — with REDD+ implementing authorities in DRC and internationally.

OGF involvement in the development of the Moabi platform supports the incorporation of knowledge and experience accumulated through the OI-FLEG project carried out by Resource Extraction Monitoring (REM) over the past two years, which focused on independent observation of logging operations. Collaborations between IIASA, OGF and EFI are foreseen to build on-the-ground capacity for independent observation and test the potential of Moabi to become the independent observation platform for the implementation of both REDD+ and FLEGT processes in DRC.

A series of Moabi initiatives were launched at a consortium meeting in July 2013. The first aims to build maps of land uses such as mining permits, logging, and agricultural expansion that compete with REDD+ projects. The maps are being developed by OSFAC and will be published in both hard-copy format and on the Moabi RDC platform.

The second initiative is an independent monitoring program for the Mai Ndombe REDD+ project. This includes establishing a network of local partners to support the mapping of community livelihoods and customary rights, and to collect information on safeguard implementation and community grievances. OGF conducted a scoping mission in Mai Ndombe in September and will conduct the first independent monitoring mission in November; it will include the pilot use of smart phone monitoring tools.

The third initiative is to test the mapping of indigenous territories and customary rights using mobile mapping tools. In partnership with the Extreme Citizen Science (ExCiteS)

research lab at University College London, the project will run a training course in mobile data collection for civil society monitors. Participants will learn how to use the ExCiteS toolkit and will test the tools in field training to collect data in partnership with a Baka pygmy NGO. The training is scheduled for January 2014. Data collected in these three initiatives will be shared through new Moabi platform being developed. The first iteration will be launched at the end November 2013, with a fully revised platform scheduled for launch in June 2014.

## Endnotes

1. "Emissions" in the context of this article stands for net emissions, i.e., the sum of emissions resulting from activities leading to deforestation, forest degradation, depletion of carbon stocks in forest soils and removals resulting from afforestation, reforestation activities or activities aiming at restoring forest carbon stocks.
2. In the context of REDD+ activities in the UN-REDD programme, National Forest Monitoring Systems (NFMSS) include Monitoring and Measurement, Reporting and Verification (M&MRV).
3. See the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for Agriculture, Forestry and Other Land Use (2006 IPCC Guidelines for AFOLU).
4. The 2006 IPCC Guidelines for AFOLU identify six broad land-use categories for estimating and reporting greenhouse gas emissions and removals from land use and land-use conversions: Forest Land, Cropland, Grassland, Wetlands, Settlements and Other Land.
5. See UNFCCC Decision 4/CP.15: Methodological guidance for activities relating to reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.
6. See [www.rdc-snsf.org](http://www.rdc-snsf.org).
7. See *Arrêté n° 004 du 15 février 2012*.
8. IPCC Guidelines provide three methodological tiers, varying in complexity, to be chosen on the basis of national circumstances. Tier 1 is a simple first-order approach; Tier 2 has a more accurate approach; and Tier 3 has higher-order methods.
9. The Mai Ndombe REDD+ project was submitted as an Emission Reduction Project Idea Note (ER-PIN) by the Government of DRC to the Carbon Fund of the Forest Carbon Partnership Facility in June 2013.