



Information note on Paraguay National Forest Monitoring System

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Disclaimer: this note is not meant to represent/ replace a user manual (which is currently in development), but rather it aims to present a brief overview of the objectives of the system.

UN-REDD
PROGRAMME



MINISTÉRIO DA CIÊNCIA E TECNOLOGIA
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1 Background

Within the context of REDD+, the set-up of a National Forest Monitoring System (NFMS) represents the need for a country to follow all the actions related to the implementation of its national REDD+ policies and measures and moreover serves as a platform to obtain access to their results. These actions should be related, directly or indirectly, to the national REDD+ strategies and may also include actions unrelated to carbon assessment, for example forest law enforcement.

The Government of Paraguay recognizes the relevant provisions of Decisions 4/CP.15 and 1/CP.16 of the United Nations Framework Convention on Climate Change (UNFCCC) and aims to implement these in Paraguay with regard to forest monitoring on national scale. More specifically, Paragraph 71 of Decision 1/CP.16 requests developing country Parties aiming to undertake REDD+ activities to develop a robust and transparent national forest monitoring system for the monitoring and reporting of the five REDD+ activities. The aim of Paraguay's NFMS is to establish such a system to address domestic and international monitoring needs and international MRV reporting requirements. Until presently, Paraguay lacked a robust, operational, wall-to-wall forest monitoring system capable of meeting the data and accuracy standards required for the REDD+ mechanism implementation. Therefore, Paraguay took the lead in exploring and designing implementation options for an operational national forest monitoring system, capable of meeting the required standards for REDD+ monitoring and reporting.

Without this process, Paraguay would have been unable to develop its nationally tailored and country-driven, robust and transparent NFMS. The country would be unable to nationally monitor the implementation of its REDD+ policies and measures and results-based demonstration activities and actions. Failing to do so would imply that the country would not be in a position to demonstrate internationally that it is implementing REDD+ activities and thus unable to receive funding for REDD+ under the UNFCCC.

This initiative aims to provide support to the REDD+ process in Paraguay under the UNFCCC, through capacity building, knowledge transfer and by means of the development of a global REDD+ wall-to-wall NFMS based on satellite data. It draws on available satellite data and existing mapping technologies and fully recognises the valuable work that has already been undertaken by various partners in this area of work. It includes tools developed and applied by a team in the Food and Agricultural Organisation (FAO) headquarters in Rome (Italy) and the Brazilian National Institute for Space Research (INPE, Sao Jose dos Campos, Brazil) and builds on concrete and existing collaborations and actions to strengthen Paraguay's technical capacities in the relevant technical directions of the Ministry of Environment (ME), the National Forestry Institute (NAFOIN) and the Federation for the Self-Determination of Indigenous Peoples (FSIP). The concept of Paraguay's NFMS was first presented at the Normative Meeting of UN-REDD in Asuncion in March 2012. The objective of this first phase of Paraguay's NFMS is to enable as soon as possible the development and implementation of the beta version of the NFMS in Paraguay, supporting by this means the Joint National Programme (JNP) of Paraguay and more specifically, the product 1.2 (ME/NAFOIN) - an information system to measure and evaluate the reduction of emissions produced by deforestation

and forest degradation. The development activities of the system and the enforcement of technical capacities will continue throughout 2012.

2 What would Paraguay like to achieve with its NFMS

Paraguay's NFMS aims to be the national tool to monitor the country's REDD+ policies and measures (PaMs). The primary objective is to relate the NFMS to biometric and dendrometric parameters and indicators such as forest area, type of forest ecosystems, expansion or establishment of protected areas, application of certification schemes, law enforcement, stakeholder and/or indigenous peoples' participation, etc. Although monitoring of Paraguay's REDD+ PaMs can potentially be related to the performance on GHG emissions and removals, this is not the main focus of the NFMS. It is therefore not the primary objective of the NFMS to 'monitor' the performance of forest area and forest area change and carbon stock and carbon stock change. Nonetheless, the objective is to communicate such information through the NFMS so that it can easily be cross-linked with several variables that will feature on the NFMS.

Although still in development, Paraguay's NFMS will aim to achieve: (i) usage by Paraguay's government to report on results obtained through REDD+ demonstration activities, results-based actions and national policies and measures in the forestry sector; (ii) have a multi-purpose methodological approach, so that Paraguay's government may use it to address monitoring needs for other relevant national or international processes; (iii) build on existing monitoring systems or system elements in Paraguay; (iv) be developed to become an operational and permanent monitoring system as an integral part of the mandates ME, NAFOIN and FSIP and its technical divisions to ensure its sustainability and independent long-term functioning.

The monitoring needs may change over time and in particular in the case of REDD+, it will follow the three- phased approach contained in Paragraph 73 of Decision 1/CP.16. In summary, "Monitoring" refers to the development of a system which:

- **Phase 1 of REDD+ (*readiness*):** This phase consists of the development and the setting up of the monitoring system. It includes all the investments in terms of systems selection and definition, capacity building, testing of such systems and the definition of national REDD+ policies and measures, including an action plan for the "National Forest Monitoring System":
- **Phase 2 of REDD+ (*monitoring*):** The implementation of the national REDD+ policies and measures will result in demonstration activities that must be results-based, i.e. resulting in measureable positive outcomes. In order to follow these activities, a Monitoring System for demonstration activities is required in Phase 2. This system will monitor the results obtained by all the demonstration activities and also provide information on land use and land use changes over areas where demonstration activities are being implemented;
- **Phase 3 of REDD+:** The monitoring system will be expanded to *cover the national territory* to validate the fact that national policies and measures implementation on the national territory are results-based (i.e. determines how much of each REDD+ activity is taking place over the national territory and how these are changing). This is achieved through a Monitoring System for

REDD+ policies and measures implementation which will allow the country to track the success of its PaMs, and subsequently, if necessary, adjust them accordingly. This monitoring system will also be the key element to support and operationalise any national subsidy or payment distribution scheme.

3 How the system was set-up

With additional targeted support from the UN-REDD Global Programme of to the UN-REDD National Programme of Paraguay, the first phase of the development and implementation of the beta version of Paraguay's NFMS was carried out during a training workshop on *Land Representation via Satellite Images* in Asuncion and FAO's headquarters in Rome (27 February – 8 March, 2012). Guided and supported by the Ministry of Environment (ME) and National Forestry Institute (NAFOIN), FAO was responsible for the development and operationalisation of the system at the national level ensuring that the necessary adaptations were made to reflect national circumstances.

Under the umbrella of the UN-REDD Global Programme, the implementation of the NFMS and building of national capacities are part of the FAO-lead activities. The NFMS is linked to other areas of work in the UN-REDD programme - such as the equitable and transparent management of multiple benefits, activities lead by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP).

3.1 Building on existing, proven and operational experiences

The development of the system relied on FAO's experiences with similar activities being supported in the Democratic Republic of Congo, Papua New Guinea, and Vietnam and with the collaboration of the National Brazilian Institute for Spatial Research (INPE). The TerraAmazon Platform was developed by INPE for national satellite monitoring and adapted to the national circumstances of each participating country. Paraguay's NFMS system is linked to the INPE platform TerraAmazon which combines GIS, image processing, database management and data access functionalities. The INPE system is free-of-charge and supported by analysis and programming teams in Brazil to ensure long-term delivery of services. Complementarily, a set of open source tools developed by FAO (Open Foris Toolkit) was used for the advanced processing of satellite images. During the training workshop held in Asuncion, 17 technicians in GIS/Remote Sensing from ME, NAFOIN and the National University of Asuncion (NUA) worked together with three FAO facilitators. The workshop included an introduction to remote sensing applied to forest monitoring, management and satellite image processing in TerraAmazon and also the advanced processing of satellite images with open source tools (OpenForis Toolkit). Based on Paraguay's available and existing information, methodologies and techniques for mapping forest cover and changes in forest cover were developed and applied in an operational and iterative manner to produce the first maps. The methodology is available on the Open Foris website: (http://km.fao.org/OFwiki/index.php/Open_Foris_Toolkit).

Additionally, the web-GIS forest information portal was developed based on the needs, national requirements and existing data at FAO headquarters in Rome, under the guidance and instruction of Paraguay's UN-REDD national team.

The web-GIS portal for the dissemination of information is still a work in progress. Preliminary maps of forest cover and changes in forest cover were produced during the workshop. The development of the web-GIS interface allows the user to view maps, calculate deforestation statistics and provide feedback on the system. The portal also allows the communication of other types of information related to Paraguay's forest resources.

Following the example of Brazil, Paraguay's NFMS allows the verification of results through a free, online and transparent system. Thanks to this transparency, the data produced can be openly viewed and cross-checked by the international community. In this way, the system allows any national (or end-user) to check an area of deforestation near their settlement online and provide feedback as to whether or not the image and interpretation are correct. This will not only lead to a transparent monitoring and verification system at the national and international level, but it will greatly enhance the participation of local communities in the implementation of national REDD+ policies and measures in Paraguay.

The development of the system has relied (and will continue to do so) on existing, structures, programmes and initiatives in the country, region and internationally – some of which already feature on the current system.

4 What's next?

The implementation of Paraguay's NFMS achieves one of the Cancun Agreement's decisions, which allows the validation of whether REDD+ activities are results-based, and thus provides one of the technical elements necessary for Paraguay to enter into Phase 2 of REDD+, once the remaining technical, social, procedural, etc, elements have been developed.

The improvement of the system and capacity development of the national UN-REDD team will continue throughout 2012. The system and maps will continue to improve with the support of FAO/UN-REDD,. Technical training for the web-GIS portal (maintenance of the system and data management) will be conducted as soon as possible in order to transfer the system to Paraguay's UN-REDD technical unit. The step-wise approach will ensure that in the future Paraguay will be able to manage the system autonomously.

It is expected that the system will become an operational forest management and information instrument and that the system will be able to inform and monitor REDD+-related PaMs.