NATIONAL FOREST MONITORING SYSTEMS FOR REDD+

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ABSTRACT

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. "REDD+" goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. In the framework of getting countries ready for REDD+, the UN-REDD Programme assists developing countries to prepare and implement national REDD+ strategies. For the monitoring, reporting and verification (MRV), FAO supports the countries to develop national forest monitoring systems (NFMS) based on satellite data that allow for credible MRV of REDD+ activities through time. The UN-REDD Programme through a joint effort of FAO and Brazil's National Space Agency, INPE, is supporting countries to develop cost- effective, robust and compatible national monitoring and MRV systems, providing tools, methodologies, training and knowledge sharing that help countries to strengthen their technical and institutional capacity for effective MRV systems. The Brazilian forest monitoring system, TerraAmazon, which is used as a multi-user basis, allows countries to adapt it to country needs. With the technical assistance of FAO, INPE and other stakeholders, the countries will set up an autonomous operational satellite forest monitoring systems. A beta version and the methodologies of the system for DRC and PNG are launched in Durban (SA) during COP 17, while Paraguay, Zambia and Viet Nam are in development in 2012.

INTRODUCTION

Under the UNFCCC, countries are committed to share information on their mitigation and adaptation policies and measures, and on the results they obtain through their implementation. To report these results, each country should have in place monitoring tools that allow a comprehensive assessment of the outcomes. Monitoring for REDD+ is required for countries to assess the outcomes of their REDD+ demonstration activities and national policies and measures, to determine whether they are results-based, as stipulated in the guidance in Appendix 1 of Decision 1/CP.16, and to assess forest carbon stocks and forest area changes, as stipulated by Decision 4/CP.14, paragraph 1(d). Monitoring for REDD+ goes beyond the assessment of parameters related to carbon. It may include any elements related to any forestry activities (e.g. logging, conservation, non-timber forest products, forestry governance and stakeholder participation, etc) that may occur in a country [1].

In contrast to MRV, for monitoring for REDD+ countries are able to define their own country-specific methodological context with criteria and parameters that should reflect their particular national circumstances. Monitoring does not always require the assessment of emissions by source and removals by sinks, as with a GHG inventory, and deals mainly with the assessment of

carbon-proxies or non-carbon-specific outcomes related to REDD+ policies and measures. Policies and measures should be implemented through a phased approach, with demonstration activities in Phase 2 which should provide an indication of the results a country can obtain nationally through REDD+ in Phase 3. Monitoring for REDD+ is the key tool to assess the results of these policies and measures and, in successful instances, to demonstrate that these are results-based. The monitoring function of the National Forest Monitoring System (NFMS) is primarily a domestic tool to allow countries to assess the participation in, and results of, REDD+ implementation by different stakeholders and institutions. The first step towards the implementation of a full Monitoring, Reporting and Verification (MRV) is to monitor activity data (AD) through this operational NFMS by classifying the entire national territory into land use and land use change classes. In the Agriculture, Forestry and Other Land Use (AFOLU) sector, activity data consists in the extent of land use and its change alone or in combination with other forest characteristics. The five activities relevant to REDD+ have to be monitored. These AD will subsequently be matched with the appropriate carbon stock, emissions, removal factors and other relevant data to estimate carbon removals and emissions. The NFMS described is an operational wall-to-wall system based on satellite remote sensing data, that monitors annual changes in land use (LU) with an approach that must be consistent with historical deforestation and degradation rate assessments, in line with IPCC requirements [2].

METHODS
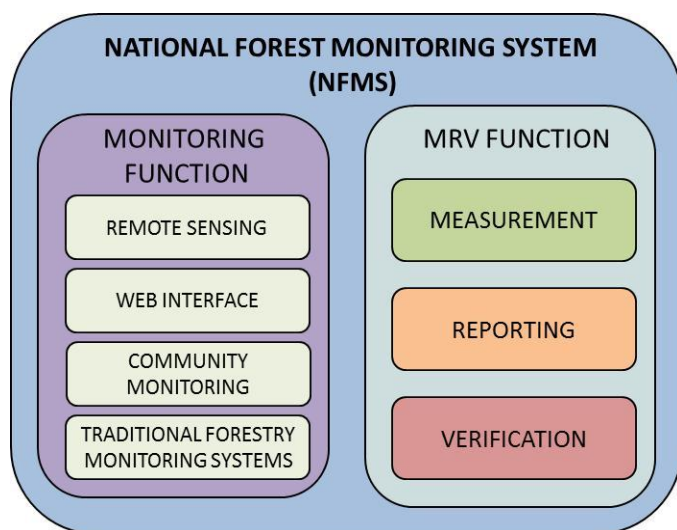
The four pillars of the NFMS (Fig. 1) are developed following the three phases of the REDD+ mechanism. They allow for the implementation of results-based demonstration activities in Phase 2 and the MRV of mitigation performance of REDD+ activities in Phase 3. Following this strategy, each phase aims to strengthen capacities and prepare for the next phase, resulting in a degree of overlap between phases, notably in terms of capacity building.

Fig. 1. The dual functions of the NFMS.

The phased approach of the REDD+ (Fig. 2) shows that Phase 2 involves the operationalization of monitoring for REDD+ to assess the outcomes of subnational demonstration activities, provided by the RLU and other relevant proxies. The transition into Phase 3 is achieved by effectively and fully operationalizing the M & MRV functions, in which a RLU (to produce AD), a National Forest Inventory (NFI) (to produce Emission Factors (EF)) and a GHG inventory for LULUCF are fully operational, in addition to the operational elements of Phase 2.
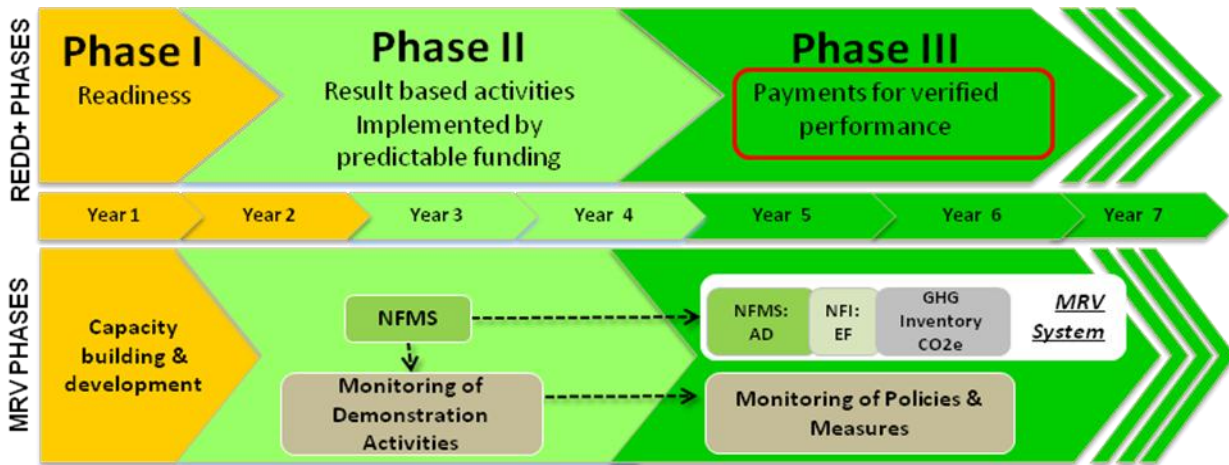
Figure 2. Phased implementation of the Monitoring & MRV functions.

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The key technical activities and elements to be undertaken in the development of the NFMS are described in Fig. 3 for the DRC example, TerraCongo. The overarching activities are: (i) remote sensing data for the TerraAmazon platform start-up development; (ii) key programming steps for the Terra-X platform start-up development and (iii) the development of a web portal for the Terra-X platform data dissemination.

Figure 3. Design of the interaction between the TerraCongo and the web interface.
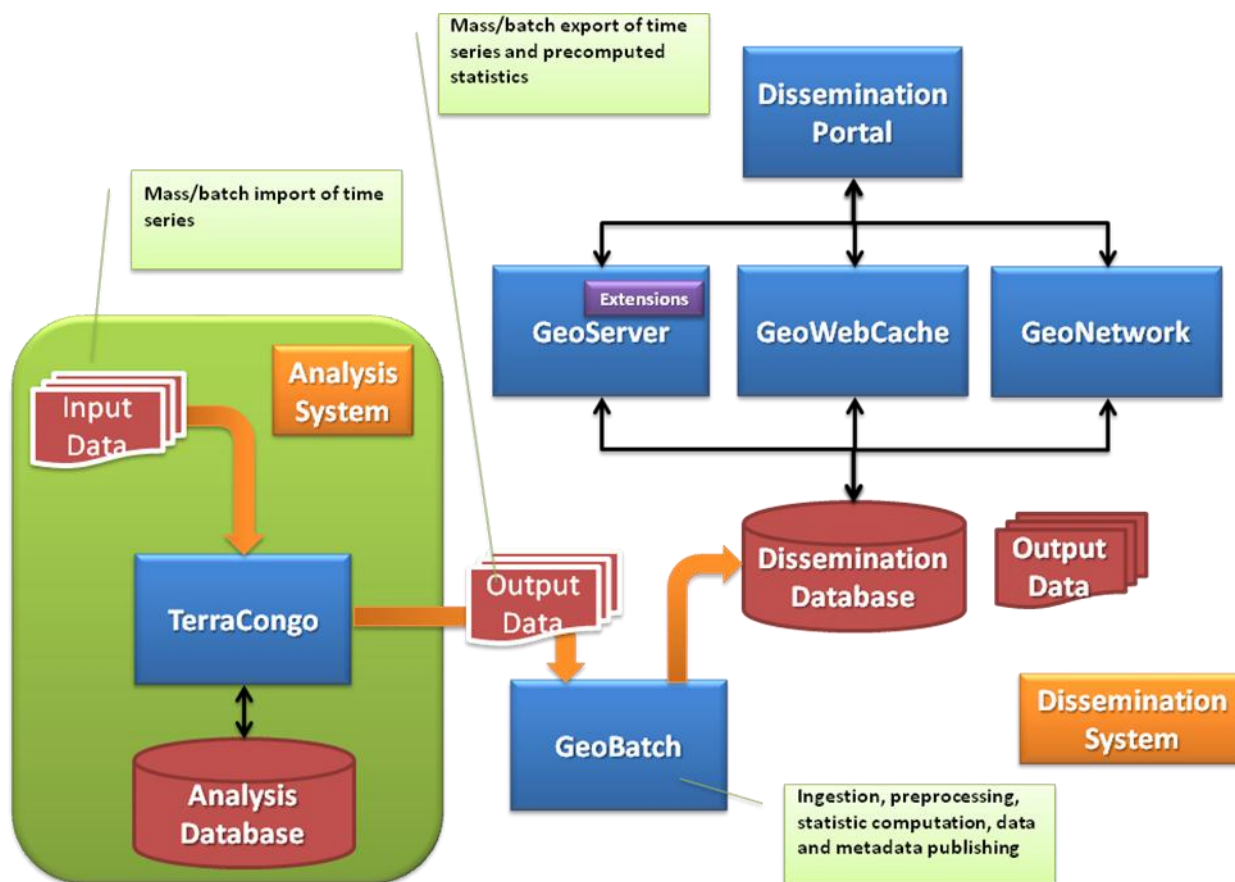
RESULTS

So far, three NFMS portals have been developed with programming teams in FAO HQ and INPE Brazil in close collaboration with the UN-REDD countries. The work is carried out at the premises of FAO UN-REDD. FAO and INPE are responsible for the system development and operationalisation of the system at a national level, ensuring that necessary adaptations are made to reflect national circumstances. The National Forest Monitoring systems have been integrated with the INPE platform TerraAmazon (e.g. renamed TerraCongo for the DRC), which combines GIS, image processing, database management and access functionalities.

The INPE TerraAmazon platform provides a suitable combination of open-source database, user interface, tools and algorithms which can be adapted according to country needs. The INPE system is free-of-charge and supported by analysis and programming teams in Brazil in order to ensure the long-term delivery and updates of services. Additionally, the INPE system allows integration of information from other technical partners and contributors for analysis and verification. National government counterparts have receives training and guidance on the System being developed by FAO and INPE for the Governments so that capacity is systematically strengthened in the country. A step-wise but full transfer of the NFMS to the countries is envisaged from 2012 onwards. The step-wise approach will ensure that the countries are able to absorb and manage the future full system autonomously.

One of the reasons for using the TerraAmazon platform is that the results can be easily verified through a free transparent online system. Due to its transparent system, the data produced by

INPE is regarded as trustworthy by the international scientific community world-wide. A similar approach will be adopted for the other NFMS. It will allow any national (or anybody in general) to go online and check an area of deforestation near their settlement and report online whether or not the image and interpretation are correct. This will not only allow for an entirely transparent monitoring and verification system on a national and international level, but it will greatly enhance the participation of local communities in the implementation of national REDD+ policies and measures in the countries. The development of the system will build on existing, structures, programmes and initiatives in the country, region and internationally – which are detailed in this document.

The actual countries for which a NFMS have been developed, are Democratic Republic of Congo, Papua New Guinea, and Paraguay. The portals are accessible through the following URLs:

DRC: http://www.rdc-snsf.org

PNG: http://unredd.geo-solutions.it:9080/

Paraguay: http://paraguay-smf.org

Regular updates are expected as new results will come available as mapping work has been carried out in-country. The development of the portals for Viet Nam and Zambia are foreseen in 2012.

CONCLUSIONS

Through the FAO UN-REDD/INPE cooperation, the countries have shown great improvement on their REDD+ readiness. The portals allow a transparent, consistent and result-based monitoring of their forest activities. The portals are available for all end-users, allowing maximal transparency and building on existing systems and algorithms. The systems are dynamic and address mainly the deforestation assessment. The other REDD+ activities will be addressed as soon as solid technologies will be available for the operationalisation.

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REFERENCES

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2 IPCC (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories.