UN-REDD PROGRAMME

INDONESIA

# MRV for REDD+

## REDD+ in Indonesia

Indonesia ranks third in terms of total area of tropical rainforest, rich in biodiversity and in carbon. Carbon stored in forests plays an important role in climate change mitigation. When emitted during deforestation and forest degradation, the carbon contributes to climate change. The expected mitigation mechanism under the United Nations Framework Convention on Climate Change (UNFCCC) would make it possible for developing countries to receive financial benefits for Reducing Emissions from Deforestation and Forest Degradation; forest conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+). As REDD+ is a mechanism where payments depend on actual emission reductions, countries will be required to quantify these reductions in REDD+. Therefore, it is a key priority for countries to establish robust and transparent forest monitoring systems.

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## Forest monitoring

The subject at the center of a future REDD+ mechanism is Measurement, Reporting and Verification (MRV) of forest carbon. That is, how can we reliably account for the amount of forest carbon, including changes over time? This is the core monitoring challenge in REDD+, well defined in greenhouse gases (GHG) reporting standards and Inter-governmental Panel on Climate Change (IPCC) guidelines, and addressing the direct objective of REDD+. The main focus is on the national level reporting to the UNFCCC, and the subsequent, anticipated accounting of valuable carbon credits for the country as a whole.

### Key-issues in MRV for REDD+

**Country driven process:** each country has to establish an autonomous MRV system. The national MRV system is a crucial element of REDD+ implementation.

**Learning-by-doing approach:** the creation of an MRV system must be based on national human resources involved in the MRV development process from the very beginning and gradually enhancing skills whilst progressing towards its full implementation.

**Safeguards**: the inclusion of the 'REDD+ Safeguards' in the monitoring system improves the consideration of biodiversity, governance and the inclusion of indigenous peoples and other forest-dependent communities.

**Consistency:** an MRV system should provide estimates that are consistent across years. Under certain circumstances, estimates generated from different methodologies in different years can be considered consistent if they have been calculated in a transparent manner.

**Transparency:** all the data and the methodologies used in the MRV system should be clearly explained and appropriately documented, so that the accuracy can be confirmed.

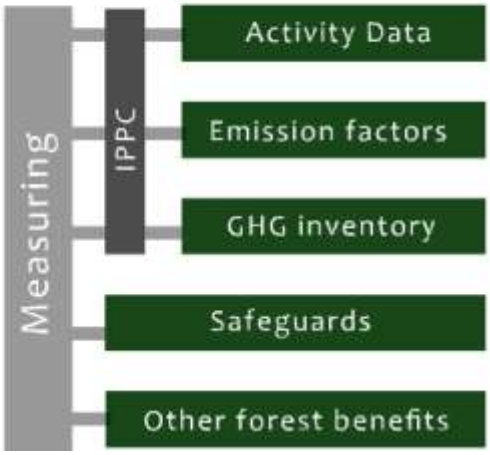
**Comparability:** estimates of emissions and removals should be comparable among countries. For this purpose, Parties should follow the methodologies and standard formats provided by the IPCC and agreed within the UNFCCC for compiling and reporting inventories.

**Conservativeness:** when completeness or accuracy of estimates cannot be achieved, the reduction of emissions should not be overestimated, or at least the risk of overestimation should be minimized.

# ABC of MRV

## Measurement

Refers to information on the extent to which a human activity takes place (activity data – AD) with coefficients that quantify the emissions or removals per unit activity (emission factors – EF). For REDD+ this translates into measurements of forest area and forest area change (AD) and forest carbon stock and forest carbon stock changes (EF). Together, this information provides the basis to compile a GHG inventory. Countries may also be required to measure indicators of safeguards and other forest benefits.





## Reporting

Implies the availability and compilation and of national data and statistics for information in the format of a GHG inventory. Reporting requirements to the UNFCCC (National Communications) may cover issues other than just those subject to measurement. The core elements of the national communications are information on emissions and removals of GHGs and details of the activities a country has carried-out to fulfill its commitments under UNFCCC.

## Verification

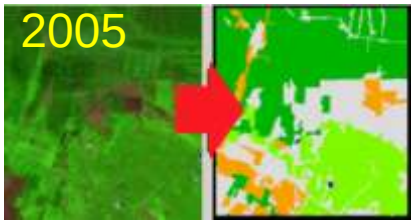
Refers to the process of independently checking the accuracy and reliability of reported information or the procedures used to generate such information. The UNFCCC Secretariat through its experts will verify the data reported.

The verification of countries' actions depends on three factors:

1) The degree to which reported data can be verified
2) The actors who conduct the verification
3) The way in which the verification is performed

# ABC of MRV

Satellite Monitoring System X National Forest Inventory = GHG Inventory

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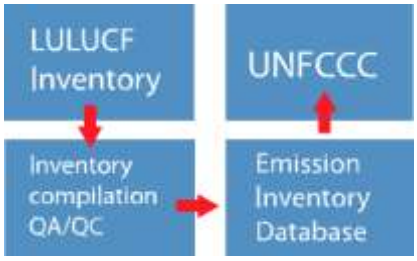
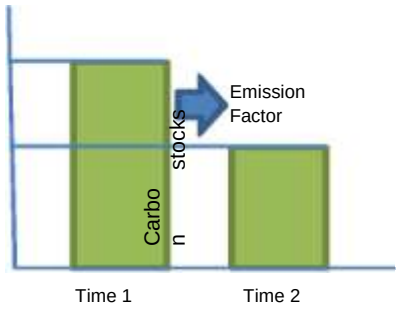



**A**ssessing the land area covered by the different forest classes. This is done with a satellite monitoring system. Measurements at different points in time are used to estimate forest area changes.

Assessing biomass, carbon stocks and emission factors. The data are obtained from a national forest inventory. Forest classification and sampling design improves the accuracy and the efficiency of the inventory.

Accounting all the greenhouse gasses. It is based on the data collected from the national forest inventory, the satellite monitoring systems and can be done using the templates developed by the UNFCCC.

**T**he data are harmonized and stored in a REDD+ database. The data on forest land area are used to develop matrices representing the changes between land uses and within the forest land area.
The data on carbon stocks and carbon stock changes are used to develop emission factors.
The data on land use changes and changes in forest uses are integrated with their respective emission factors to establish the GHG inventory. The data are used to report to UNFCCC.




**T**he verification process concerns all the variables that were reported under REDD+. The verification can be done by several institutions including the civil society. All the data, including the satellite and national forest inventory data are made available in order to allow the verification of the GHG inventory. Means of verification include interviews with key government officials and national NGOs, reports, media reports, training materials.

# Making MRV work in Indonesia

## Capacity building for MRV

The UN-REDD Programme works together with the Ministry of Forestry in establishing a robust and transparent MRV system. Under outcome 2 of the National Joint Programme for Indonesia, UN-REDD works towards *"Improved capacity and methodology design for forest carbon inventory within a Measurement, Reporting and Verification System (MRV), including sub-national pilot implementation".*

The basic elements for a national MRV system need to be developed in accordance with the guidance and guidelines of the IPCC. Therefore the focus is on the National Forest Inventory, a Satellite Monitoring System and the GHG Inventory.

## National Forest Inventories

In collaboration with the Directorate of Forest Resources Inventory and Monitoring, the UN-REDD programme will develop a new methodological approach for the existing National Forest Inventory (NFI) and strengthen capacity to apply this. This includes improved protocols for carbon measurements at the field level. An improved NFI should allow assessing the forest carbon content according to the IPCC Land Use and Land Use Change and Forestry.
The Forest Inventory will be tested in Central Sulawesi where it will be implemented in collaboration with BPKH and Dinas Kehutanan of Central Sulawesi and Tadulaku University in Palu. Experts of the Ministry of Forestry will use the data to calculate Emission Factors.

## National satellite forest monitoring system

The UN-REDD Programme aims to establish a robust monitoring system building on existing experience. Satellite imagery will be used to monitor land use change in Central Sulawesi. In addition, the global UN-REDD Programme provides opportunities for collaboration with various institutions in different countries, such as the National Institute for Space Research (INPE) in Brazil. This specific collaboration allows REDD+ countries to learn and share their experiences in setting up autonomous satellite forest monitoring systems that are a valuable tool to report GHG emissions following the IPCC Guidelines and Guidance.

## Green House Gas Inventory

The National Forest Inventory and the Satellite Monitoring System together provide the data required for a Green House Gas Inventory for Central Sulawesi. The resulting information will be shared and linked with other activities implemented in Indonesia, such as the Indonesian National Carbon Accounting System (INCAS) and others.

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UN-REDD Programme Indonesia is a joint working programme between Indonesian Goverment (Ministry of Forestry) with UNDP, FAO and UNEP. The purpose of this programme is to assist Indonesian Goverment in self preparation towards mechanism implementation of REDD+ (REDD+Readiness)
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