UN REDD
Programme
Indonesia

DEVELOPMENT OF MRV INDONESIA

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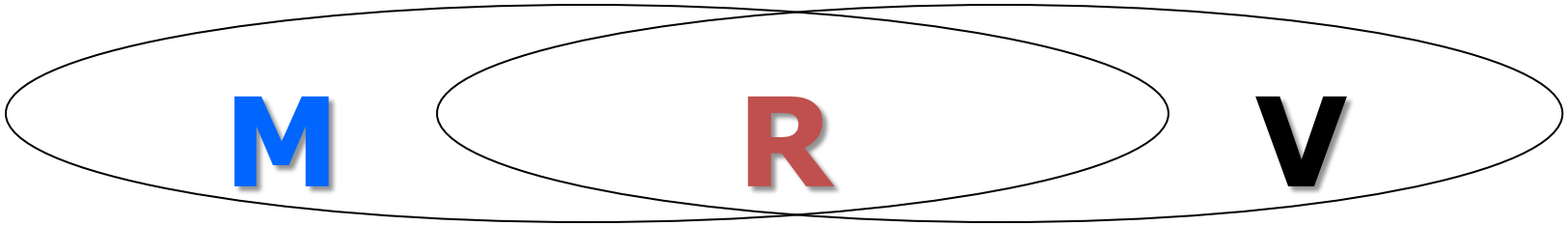
Bangkok, 10 November2010

UN REDD
Programme



Country level	International reporting	External independent verification
Monitoring systems at national level (forest inventories)	Reported in a standardized way to an independent body	

- Monitoring systems to be designed to facilitate the reporting and verification
- Guidelines for monitoring are indicated in COP decisions (2/CP.13 and 4/CP.15), may need additions but probably good enough to start developing monitoring systems
- Guidelines and modalities for reporting and verification still to be developed by the COP

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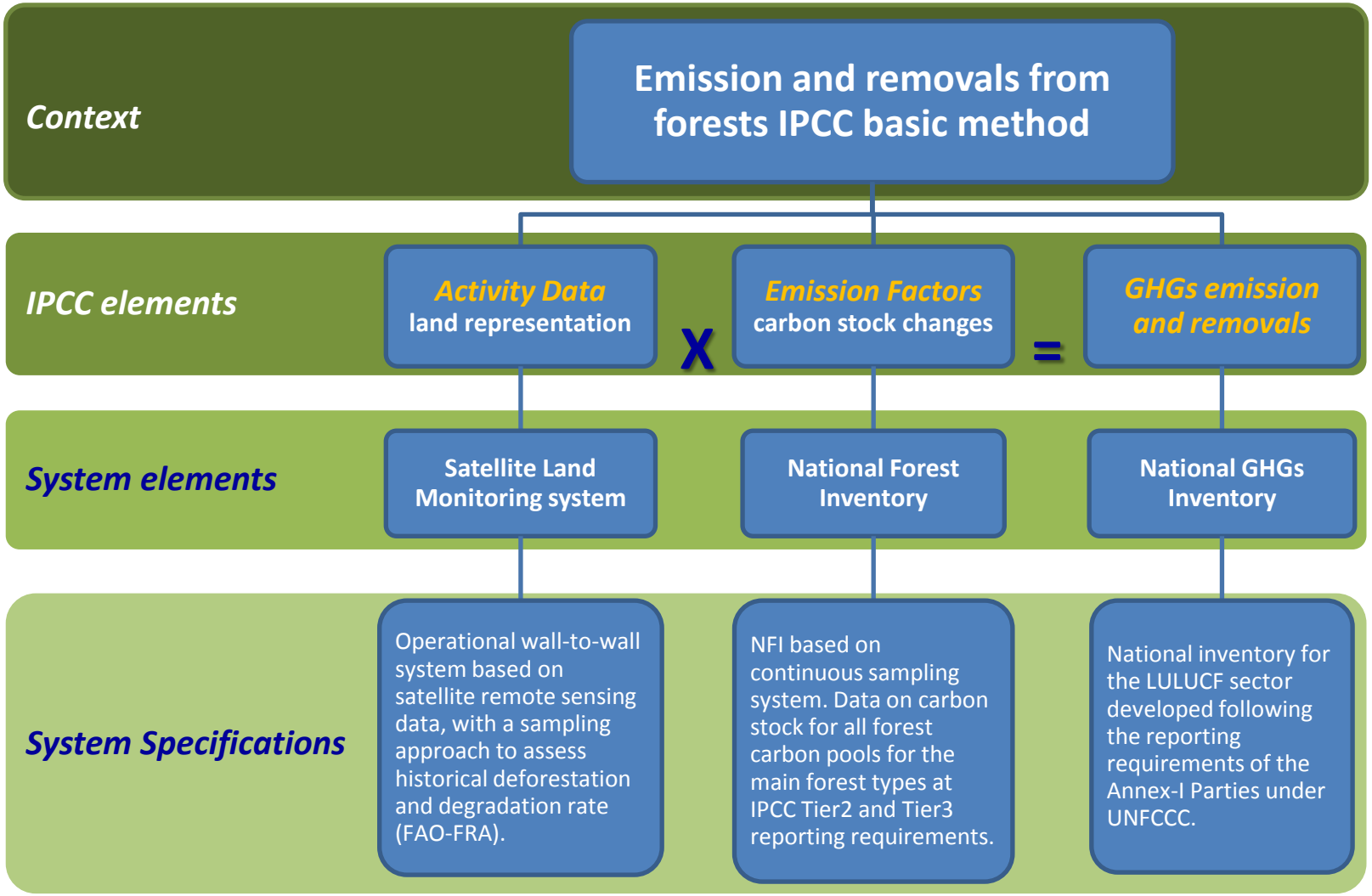
MRV basic elements under IPCC

Applied to Central Sulawesi Province



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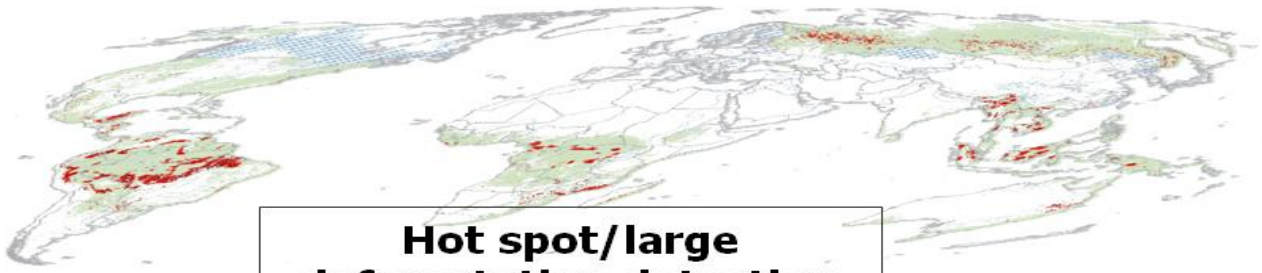
Developing MRV System

Global observations

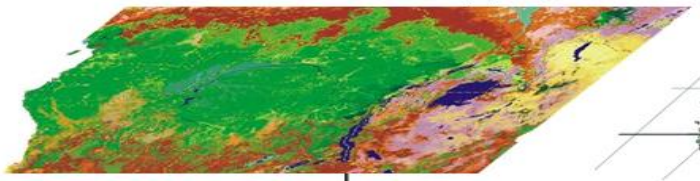


MODIS/MERIS-type sensors
Deforestation (<10-20 ha)
(intra-) annual
Hot spots of forest change
Top-down standards

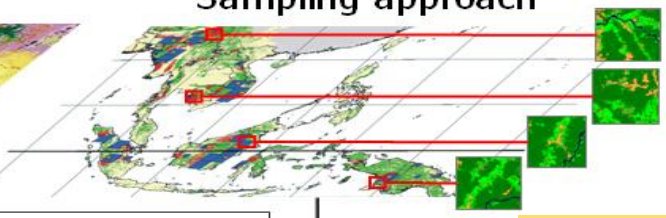
Hot spot/large deforestation detection

Regional/national observations

Wall-to-wall mapping



Sampling approach



Landsat/Spot-type / SAR
Deforestation (<0.5-1 ha)
(inter-)annual
Regionally-tuned forest degradation mapping
Bottom-up flexibility

Change in forest area and density

Emisi/Serapan = DA * FE/FS

Fine-scale/in-situ observations

Estimation of carbon emissions

Forest inventories
In-situ/plot data-projects
Targeted remote surveys—e.g. Lidar and aerial imagery
FAO statistics
IPCC-GPG / AFOLU

Source IFCA (2008)

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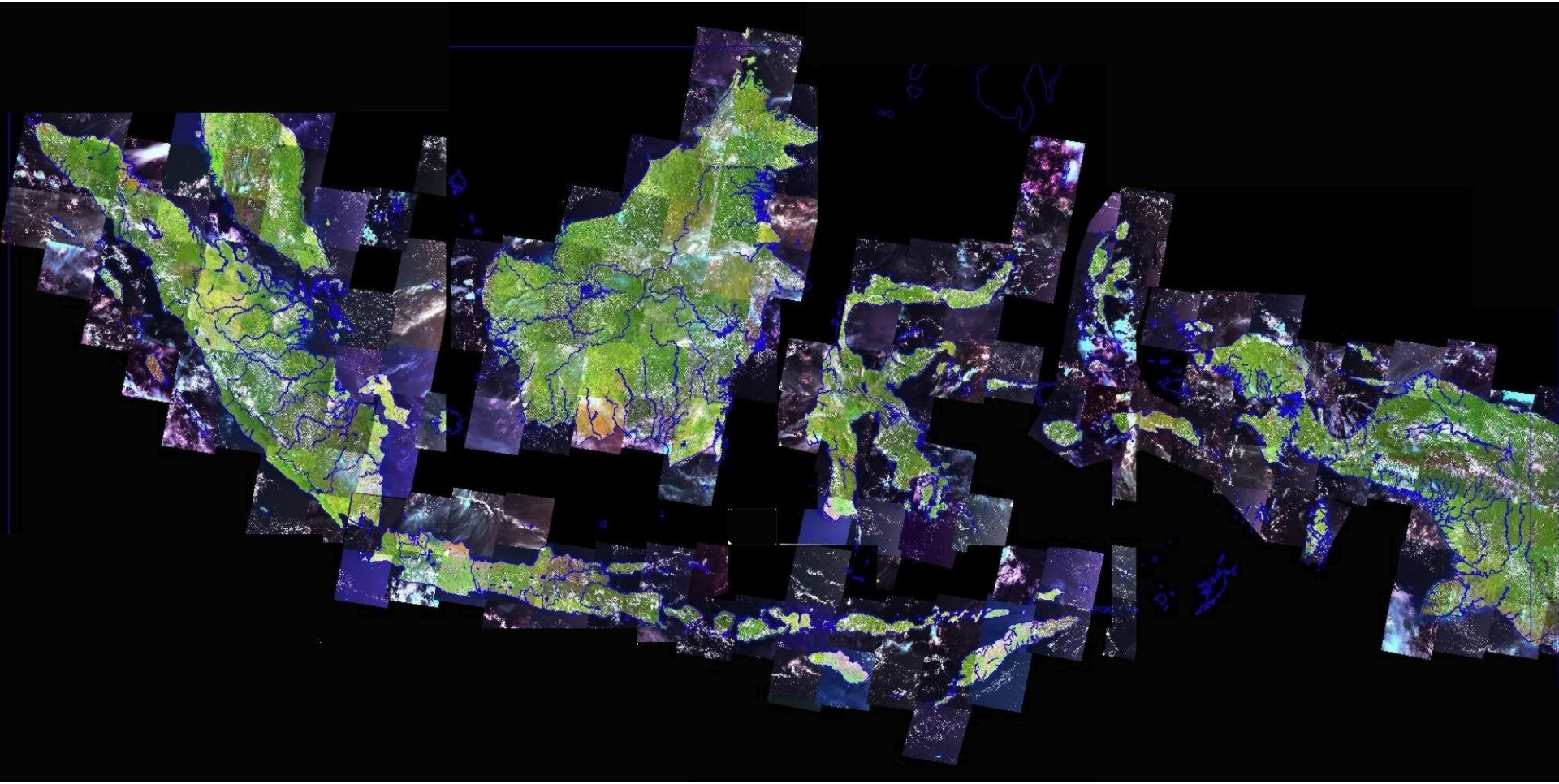
Landsat images mozaic



Remark: Landsat 7 ETM+ coverage for the whole Indonesia (217 scene)

Source: MoFor

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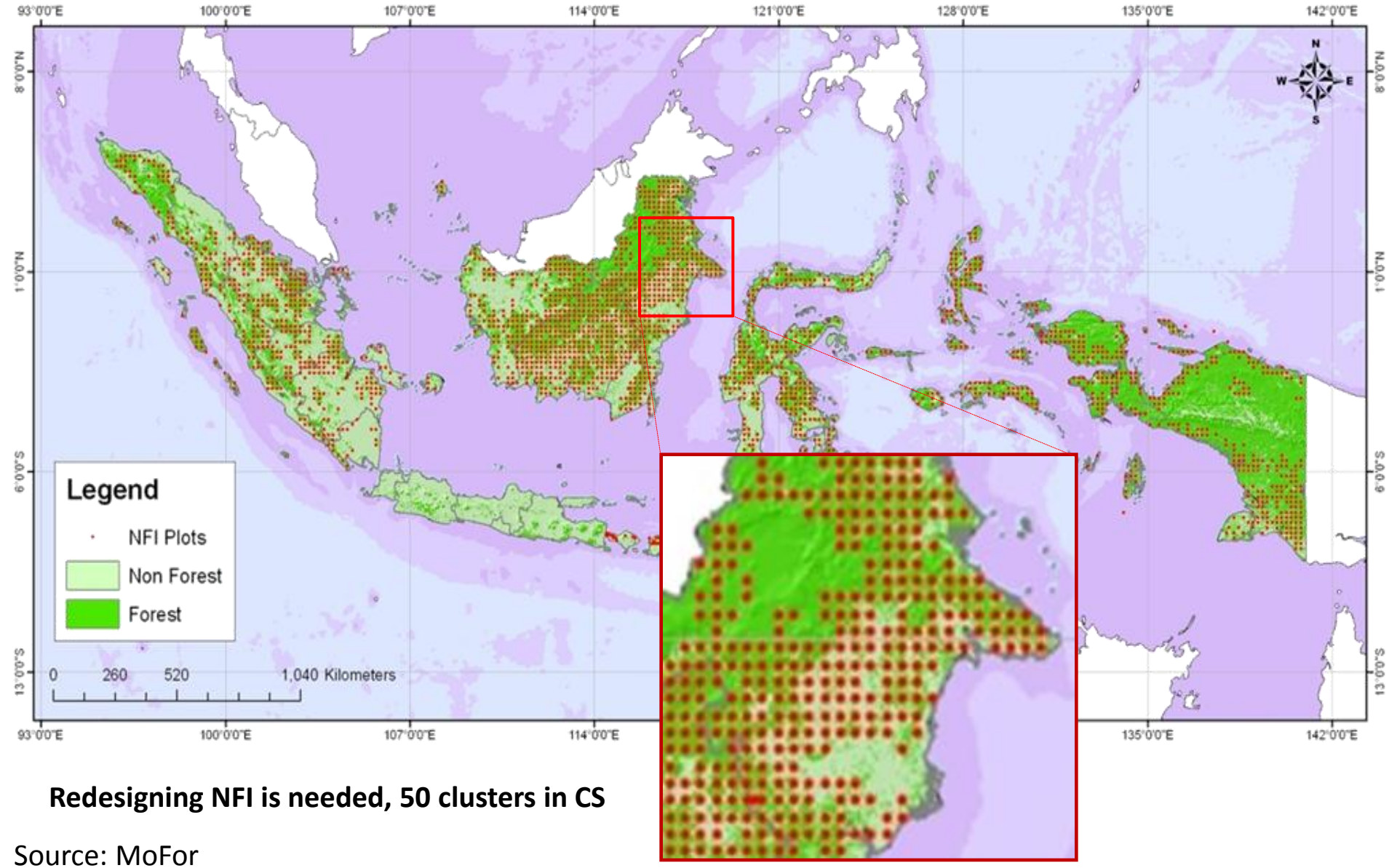
Distribution of NFI Cluster Plots



Redesigning NFI is needed, 50 clusters in CS

Source: MoFor

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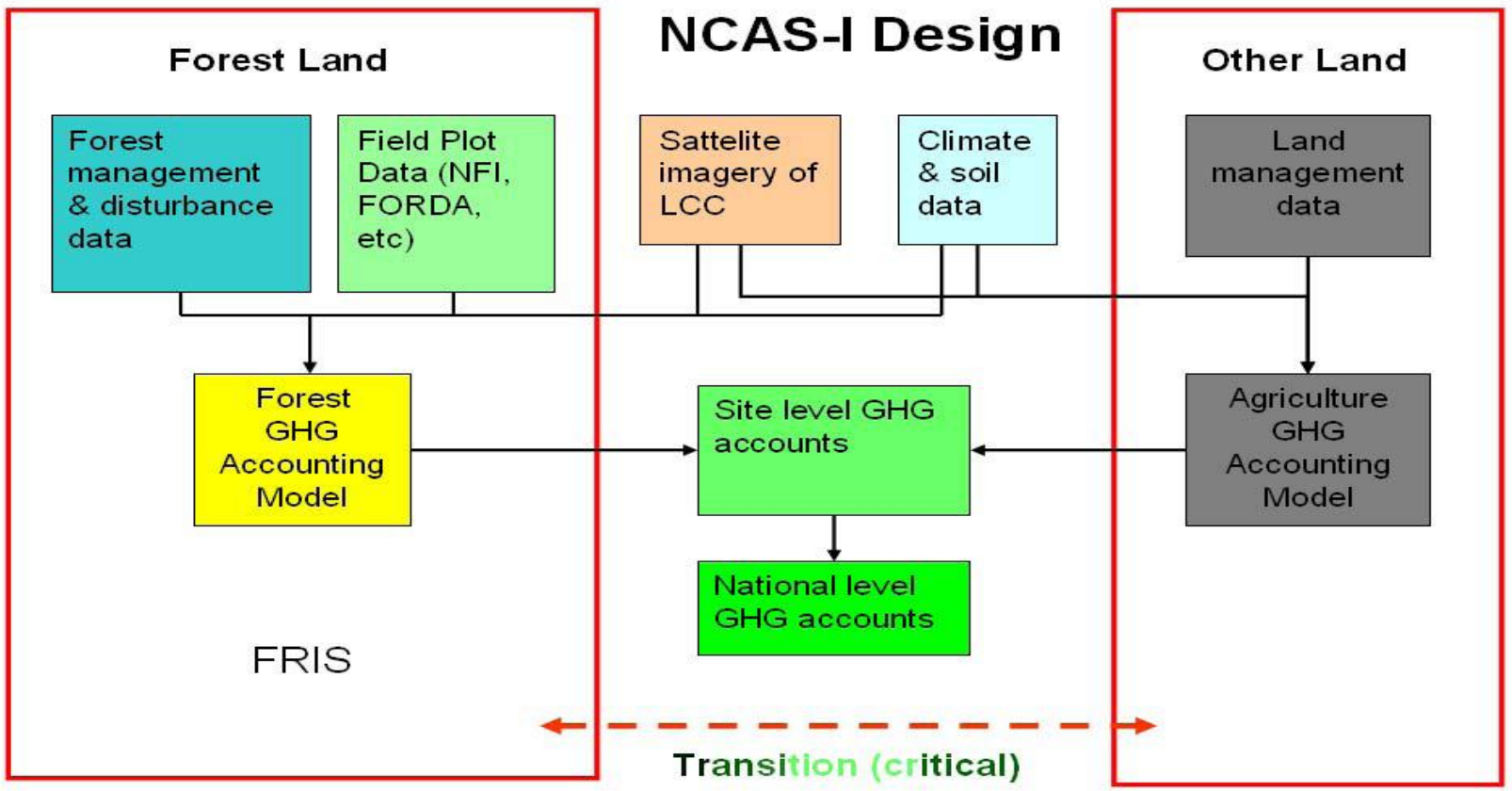
Indonesia National Carbon Accounting System



UNREDD results will feed into INCAS

Source: MoFor

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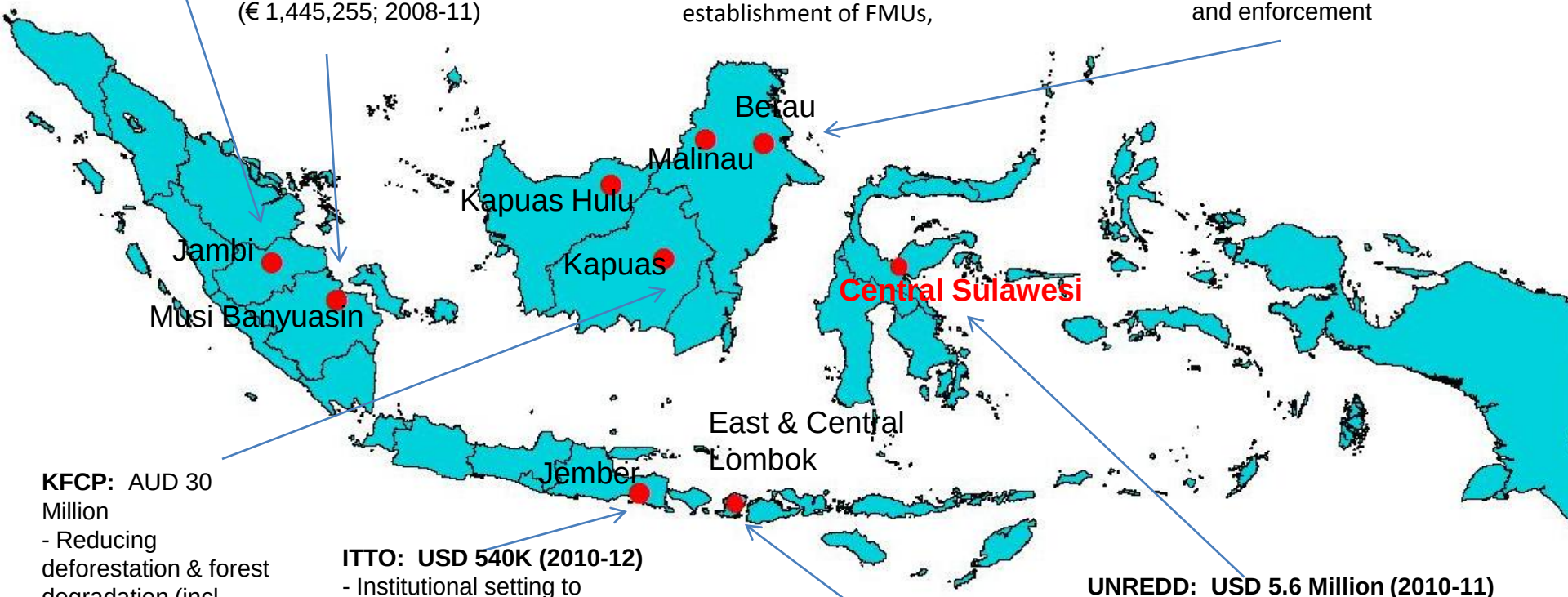
Demonstration Activities

Proposed AusAID 2nd Demonstration Activities

GTZ Merang, incl:
- Measures to restore forest areas
-Strategies and structures for peat forest management Integrated
-Fire management scheme.
(€ 1,445,255; 2008-11)

KFW-GTZ Project (TC €6 Million 2010-2012 + FC € 20 Millions; 2010-12017)
Innovative designs for REDD demonstration activities incl. establishment of FMUs,

TNC: Demonstration activities: improved forest management, forest restoration, oil palm swap, land use planning, policies and enforcement



KFCP: AUD 30 Million
- Reducing deforestation & forest degradation (incl. rehabilitation of peatland);
Monitoring & carbon accounting;
Payment mechanism:
- Readiness at provincial and district

ITTO: USD 540K (2010-12)
- Institutional setting to prevent deforestation;
-Technology in restoration and rehabilitation of PSF;
- Demonstration activities with the plantation of indigenous species.

KOICA: USD 5 Million (2009-13) Joint research and implementation of pilot project on afforestation/reforestation CDM project and REDD

UNREDD: USD 5.6 Million (2010-11)
Capacity for spatial socio-economic planning incorporating REDD;
Empowered local stakeholders to benefit from REDD;
Multi-stakeholder-endorsed district REDD plans

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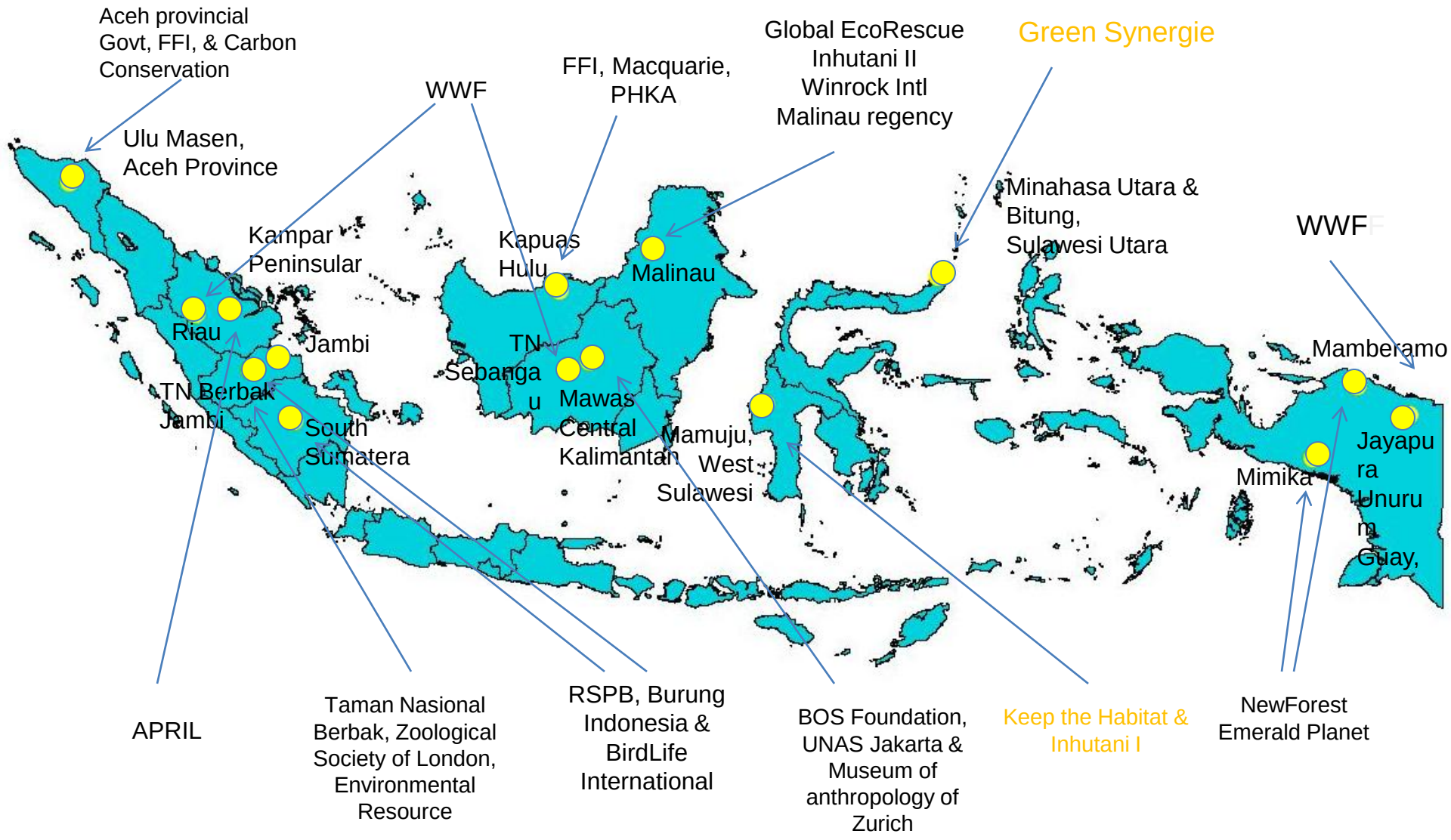
(Some of) Voluntary Activities



Possible mandates for an MRV agency

PRELIMINARY

Control of agency	REDD+ emission	Total emissions	Finance
High	▪ **Implementing** data collection of emissions from **deforestation** and **degradation** ▪ **Report** and **verify** data	▪ **Implementing** data collection of emissions from **all sectors** ▪ **Report** and **verify** data	▪ **Implementing** data collection of emissions from all sectors and distribute funds from **verified carbon-reduction activities** ▪ Report and verify data
Low	▪ **Coordinating** data collection of emissions from **deforestation** and **degradation** ▪ **Report** and **verify** data	▪ **Coordinating** data collection of emissions from **all sectors** ▪ **Report** and **verify** data	▪ **Coordinating** data collection of emissions from all sectors and distribute funds from **verified carbon-reduction activities** ▪ Report and verify data

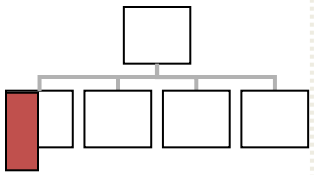
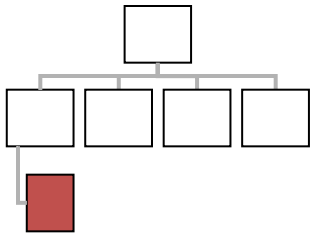
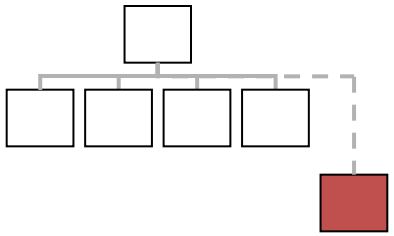
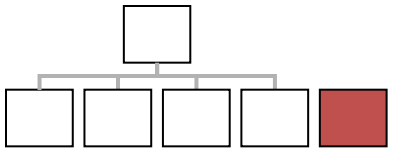
Low — **Scope of agency** — High

(Establishment of independent MRV agnecy is part of LoI)

Source: UKP4

Possible legal structures for an independent MRV agency

PRELIMINARY

	An unit within a ministry	Agency reporting to minister	Agency reporting to president	Agency reporting to public
How does it look like?				
Examples	▪ Treasury within Ministry of Finance, etc.	▪ BPS ▪ BMKG ▪ LAPAN	▪ UKP4 ▪ DNPI ▪ BRR	▪ Corruption Eradication Commission (KPK)

Low — **Degree of independency** — High

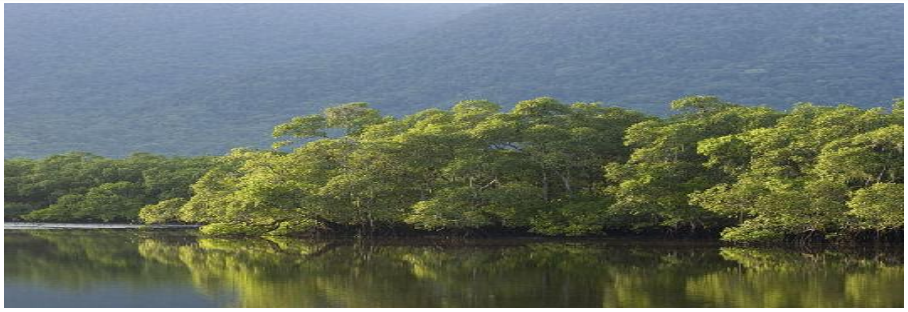
MRV agency

(Suggestion:Reporting to REDD+ Agency)?

Source: UKP4

UN REDD PROGRAMME INDONESIA

MRV and forest monitoring for REDD+ in Indonesia



REDD+ in Indonesia

Indonesia holds the world's third largest tropical rainforest, rich in biodiversity and in carbon. Carbon stored in trees plays an important role in climate change mitigation. When emitted during deforestation and forest degradation, the carbon contributes to anthropogenic climate change. The expected REDD+ 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 result based mechanism, countries will be required to quantify their achievements in REDD+. Therefore, it is a key priority for countries to establish robust and transparent forest monitoring systems.

Forest monitoring

The most commonly debated subject 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 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 development of an MRV system has to be based on in-country human resources being involved in the MRV development process from the very beginning and gradually improving 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 local 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 anyone can verify their correctness.

Comparability: estimates of emissions and removals should be comparable among Parties. 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.

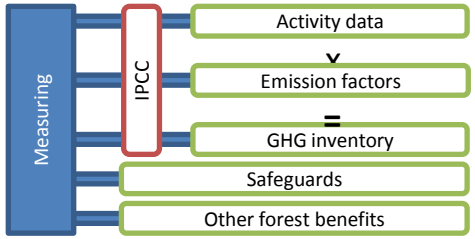
Conservativeness: when completeness or accuracy of estimates cannot be achieved, the reduction of emissions should not be overestimated, or at least the risk of overestimation should be minimized.

The ABC of MRV

MRV and forest monitoring for REDD+ in Indonesia

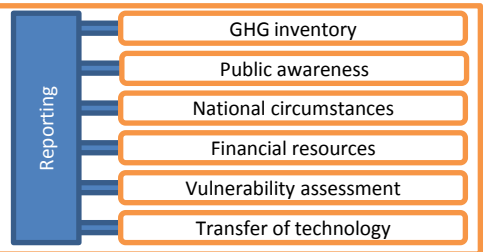
Measurement

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

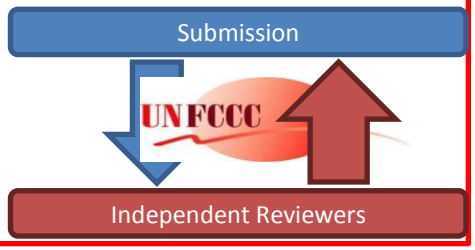
Implies the compilation and availability of national data and statistics for information in the format of a GHG inventory. Reporting requirements to the UNFCCC (National Communications) may cover issues other than just those subject to measurement. The core elements of the national communications are information on emissions and removals of greenhouse gases (GHGs) and details of the activities a country has undertaken 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 information. The UNFCCC Secretariat through its experts will verify the data reported. The verification of countries' actions depends on three factors:

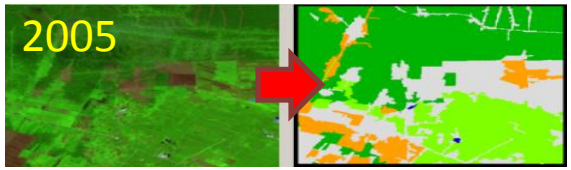
1) the degree to which reported data is capable of being verified;
2) the actors who conduct the verification;
3) the way in which the verification is performed.

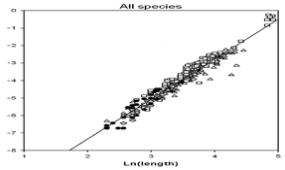


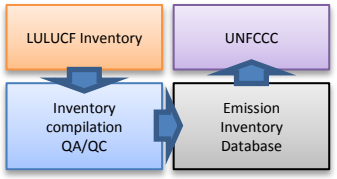
The ABC of MRV

MRV and forest monitoring for REDD+ in Indonesia

Satellite monitoring system **x** National Forest Inventory **=** GHG inventory







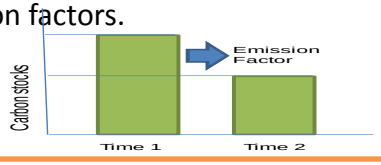
Assessing the land area covered by the different forest classes. This is done with a satellite monitoring system. Measurements at different points in time are used to estimate forest area changes.

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 greanhouse 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.

The data are stored and harmonized into 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.

The 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. The different means of verification are: through interviews with key government officials and national NGOs, reports, media reports, training materials, etc.

UN-REDD and MRV 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 elements focused on are National Forest Inventory, Satellite Monitoring System and Green House Gas 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 already existing National Forest Inventory (NFI) and build 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 LULUCF. 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 within the Ministry of Forestry will use the data to calculate Emission Factors.

National satellite forest monitoring systems

The UN-REDD programme aims to establish a robust monitoring system building on existing experience of the Ministry of Forestry. Satellite imagery will be used to monitor land use change in Central Sulawesi. In addition, the global UN-REDD programme offers possibilities for collaboration with various institutions in different countries, such as the National Institute for Remote Sensing – INPE - in Brazil. This specific collaboration provides the opportunity among REDD+ countries to learn and provide experience about setting up autonomous satellite forest monitoring systems that will also be valuable as a tool to report GHG emissions following the IPCC Guidelines and Guidance. Such sharing between countries can benefit Indonesia and other countries.

Green House Gas Inventory

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