



# CAMBODIA REDD+ PROGRAMME

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- **Presentation Title: Update on MRV (National Forest Monitoring System) readiness process in Cambodia**
- **Location: Forestry Administration**
- Date: 09 January 2014



# Outline

## Update on MRV (National Forest Monitoring System) readiness in Cambodia

1. Introduction to **National Forest Monitoring System (NFMS)**
2. Overview of NFMS **supporting frameworks** to Cambodia
3. Current **achievements**



Part 1.

# Introduction to **National Forest Monitoring Systems**

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# National Forest Monitoring system (NFMS)

NFMS has **two functions** in REDD+ context:

- I. **Monitoring** (M) of Policies and Measures
- II. **Measurement, Reporting and Verification** (MRV) of emissions & removals

NFMS will be developed in a stepwise approach:

- Develop the NFMS in a stepwise approach through 3 Phases of REDD+ (1. Readiness, 2. Result-based demonstration, 3. Result-based actions)
- Fully operational in Phase 3, to allow for positive incentives under an international mechanism



# I. **Monitoring** function of NFMS

## Objectives:

- To deliver a comprehensive assessment of the outcome of REDD+ Policies and Measures
- Monitor national actions and to report to international conventions and other commitments
- To include carbon stocks plus other information requirements to assess performance and safeguards e.g: Forest health and condition, Biodiversity, Socio-economic functions
- To develop efficient, equitable resource allocation mechanisms
- To provide information necessary for non-REDD+ purposes, for wider forestry and land use sector objectives



# I. **Monitoring** function of NFMS

Practice:

- The monitoring function of NFMS can be defined only broadly. Its components will vary depending on national circumstances. Therefore primarily a tool to allow countries to assess and refine Policies and Measures
  - implementation and performance
  - Indicators to track implementation of a specific policy or measure – proxy indicators for forest carbon e.g. volume of timber harvested through an SFM measure, as a proxy for impact on carbon
- Using existing tools where possible (e.g. network of forestry officers) and new tools where necessary (e.g. satellite remote sensing system)
  - Need to Harmonize existing tools with new tools and with newly required capacities for MRV



## II. **MRV** function of NFMS

Objectives:

- To **M**easure the emissions coming from forests and land use change as outcomes of REDD+ activities
- To **R**eport these emissions to the UNFCCC following the most recent methodological guidance of the Intergovernmental Panel on Climate Change (IPCC)
- To **V**erify the results by making the emissions inventory available for review by the UNFCCC



## II. **MRV** function of NFMS

Practice:

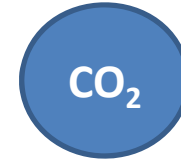
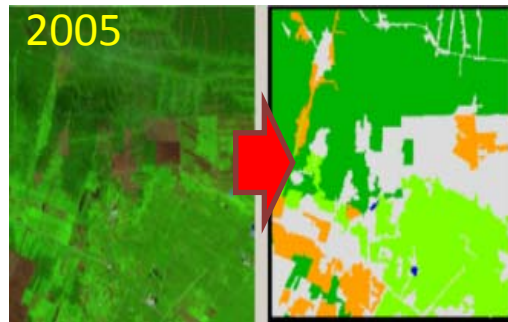
The MRV function will always consist of three (3) main components also called **'pillars'**:

- 1. The satellite land monitoring system (SLMS)**  
To collect Activity Data (AD)
- 2. The national forest inventory (NFI)**  
To gather information to obtain emission factors (EFs)
- 3. The national GHG inventory (GHG-I)**  
To provide emissions & removals estimates for national report



## II. MRV function of NFMS

### The Three Pillars of MRV



	FL, Moist evergreen	FL, Moist semi-deciduous	FL, South-west subtype	FL, North-west subtype	FL, Dry semi-deciduous	Agricultural land	Settlements	Other land	Unclassified	Final Area
FL, Moist evergreen	51									51
FL, Moist semi-deciduous	42	60								102
FL, South-west subtype			52							52
FL, North-west subtype				12						12
FL, Dry semi-deciduous					2	25	2			29
Agricultural land	5	2			2	3	1			13
Settlements					3	1	20			25
Other land								12		12
Unclassified									25	25
Initial Area	56	44	61	52	13	8	29	22	12	25
Net change (Δ = T0-T1)	-4	-2	-3	0	-4	-2	-12	3	1	-11

Area change data from satellite remote sensing, and NFI

Forest carbon stock data from a national forest inventory, and possible sources

Inventory of greenhouse gas emissions from the forest sector

ACTIVITY DATA

EMISSION FACTOR

EMISSIONS ESTIMATE

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## II. **MRV** function of NFMS

### The satellite land monitoring system (SLMS)

To collect Activity Data (AD)

- **Activity Data (AD)** shows the extent and magnitude of a particular human-induced activity e.g. Land area changes, Area / forest change in hectares per year
- Achieved using SATELLITE REMOTE SENSING and GIS, and FIELD DATA (eg. supported by NFI)
- **Three approaches** to AD collection for land area, recommended by IPCC
  1. Net change in total areas of land categories within a defined spatial unit (e.g. a country)
  2. Tracks land use conversions between categories
  3. Tracks conversion between categories on a spatially-explicit basis



## II. **MRV** function of NFMS

### The national forest inventory (NFI)

To gather information to obtain accurate and robust emission factors (EFs)

- **Emission Factors (EFs)** are coefficients that quantify emissions or removals of GHGs per unit of a specific human-induced activity e.g. tCO<sub>2</sub>e per ha of forest cleared. It is an average value, an estimate.
- IPCC identifies **3 ‘tiers’ of methods** to obtain estimates, with increasing accuracy
  1. Use IPCC default EF data (EF database); (not eligible under REDD+)
  2. Apply country- or region-specific EFs which allow more disaggregated AD
  3. Regular, detailed inventories used to create very specific EFs and models



## II. MRV function of NFMS

### The national GHG inventory (GHG-I)

To provide emissions & removals estimates for national reports

- Countries submit GHG inventories as part of their “**National Communications**” to the UNFCCC Secretariat
  - Countries have to report only on human induced emissions and removals (managed land as proxy to identify human interventions)
  - IPCC has published guidelines on how to prepare and compile a GHG Inventory (<http://www.ipcc-nggip.iges.or.jp/public/index.html>)

By decision 1/CP.16, , the COP decided that non-Annex 1 Parties should submit their national communications every 4 years. In the Durban outcome, it was further decided that non-Annex 1 Parties would submit **Biannual Update Reports (BURs)** every 2 years.



Part 2.

# Overview of NFMS **supporting** **frameworks** to Cambodia

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# Initiatives supporting implementation of the Cambodia

Outcome	Major Supporting Frameworks						
	UN-REDD	CAM-REDD	FCPF	FAO's TCP-NFI	LCAF	Embassy of Japan	REDD Projects in Community/Protected Forests
Outcome 1: Institutional Arrangements	✓✓	✓	✓✓		✓✓		
Outcome 2: Strategies/Policies	✓✓	✓	✓✓		✓✓		
Outcome 3: Projects/Sub National Development	✓	✓✓				✓✓	✓✓
Outcome 4: MRV/REDD+ GHG Emissions Registry/Reporting to GHG Inventory	✓✓	✓✓	✓	✓✓		✓✓	✓

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# National NFMS (MRV) support:

1. **Cambodian UN-REDD Joint Programme (FAO/UNDP/UNEP):** FAO responsible for Outcome 4 - Forest Monitoring and MRV section (Ongoing; 2011 – 2014)
2. **CAM-REDD (FA/JICA) :** Supporting both MRV and sub/national development
3. **Forest Carbon Partnership Facility (FCPF):** MRV Component (2014 -2016)
4. **FAO TCP/CMB/3304 –** Designing a multipurpose National Forest Inventory (finalizing)
5. **National Forest Inventory:** sources for implementation to be indicated

## Notes:

- UNREDD Programme and CAM-REDD support to establish capacities and systems at the national scale (NFMS, MRV, etc.).
- FCPF to improve the NFMS (eg. Allometric Equitation development) and test the developed systems (incl. Manuals, REL accounting system, etc.) on a subnational scale (subnational – national link)
- FAO TCP and subsequent implementation of the NFI to facilitate the implementation of the UN-REDD national programme (e.g. by development of more robust emission factors)



# UN-REDD Programme (outcome 4) in brief

## **Outcome 4: Design of a Monitoring System and Reference Emissions Level framework and capacity for implementation**

**Output 4.1:** Establishment National MRV/REL Technical Team and build appropriate national capacity;

**Output 4.2:** Develop Cambodia Monitoring system plan;

**Output 4.3:** Review of the forest cover assessments to provide REDD+ activity data and design the satellite forest monitoring system;

**Output 4.4:** Design of a National Forest Inventory to develop emission and removal factors for REDD+ related activities;

**Output 4.5:** Support the development of a REDD+ related GHG Reporting System;

**Output 4.6:** Support the development of Cambodia RL/REL framework.



Part 3.

# Current **achievements**

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# Establishment National MRV/REL Technical Team and build appropriate national capacity

- Four (4) technical teams will inform and advise the REDD+ taskforce on their respective areas
  - The ToR for the MRV Technical team has been approved in the first taskforce meeting.
  - The first Technical Team meeting will be organized 20 January 2014
- A joint MRV training programme with UN-REDD and JICA has been prepared which will be reviewed by the technical team;
- Several meetings and workshops have been held including a GHG workshop and training in respective technical areas (EG. Remote sensing, GIS , use of tools, allometric equations, and forest inventories)



# Develop Cambodia Monitoring system plan (NFMS)

- A report on the existing national and subnational classification is available.
- A National consultation has been held on Land Cover Classification and forest monitoring systems. Consultants have been involved to compile existing data and land cover/use systems for comparison and advice on a harmonized legend.
  - LCCS workshop planned for February 2014.
  - Time series of land use maps to be created for GHG reporting requirements



# Develop Cambodia Monitoring system plan (NFMS)

Example: consistency and comparability

BPAMP 2007			FA 2002, 2006 & 2010				
GENERAL ECOLOGY		VEGETATION FORMATION	EF	SEF	DF	OF	NF
VERY HUMID	Low Elevation	Dense Evergreen Forest					
	Medium Elevation	Dense Evergreen Forest					
HUMID	Low Elevation	Dense semi-deciduous Forest					
		Dense forest/secondary vegetation mosaic (dense forest predominant)					
		Dense forest/secondary vegetation mosaic (secondary vegetation predominant)					
	Medium Elevation	Savannah					
		Dense semi-deciduous Forest					
SUB-HUMID FORMATIONS		Mixed Deciduous Forest					
		Woodland with <i>Dipterocarpaceae</i>					
		Degraded Woodland with crops					
		Dense Thicket					
EDAPHIC FORMATIONS		Swampy degraded plant communities (flooded forests)					
		Herbaceous hydromorphic types					
OTHER FORMATIONS		Mosaic of crops and degraded vegetation					
		Paddy fields					
		Paddy fields with <i>Borassus flabellifer</i>					

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# Review of the forest cover assessments to provide REDD+ activity data and design the satellite forest monitoring system (SLMS)

- A delegation of Cambodian technical specialist has been to INPe Brazil to complete a training on forest monitoring system.
- A inventory report on existing satellite and aerial imageries has been prepared
- Available Remote sensing and GIS data has been compiled, and a test version of satellite forest monitoring system web platform is under development



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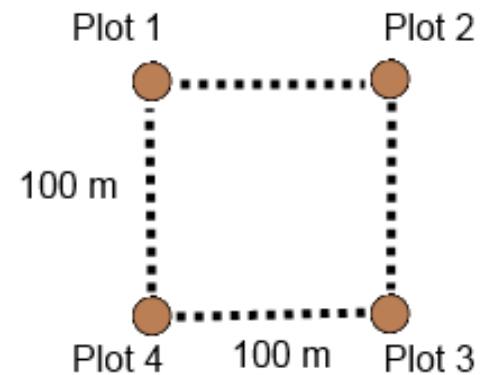
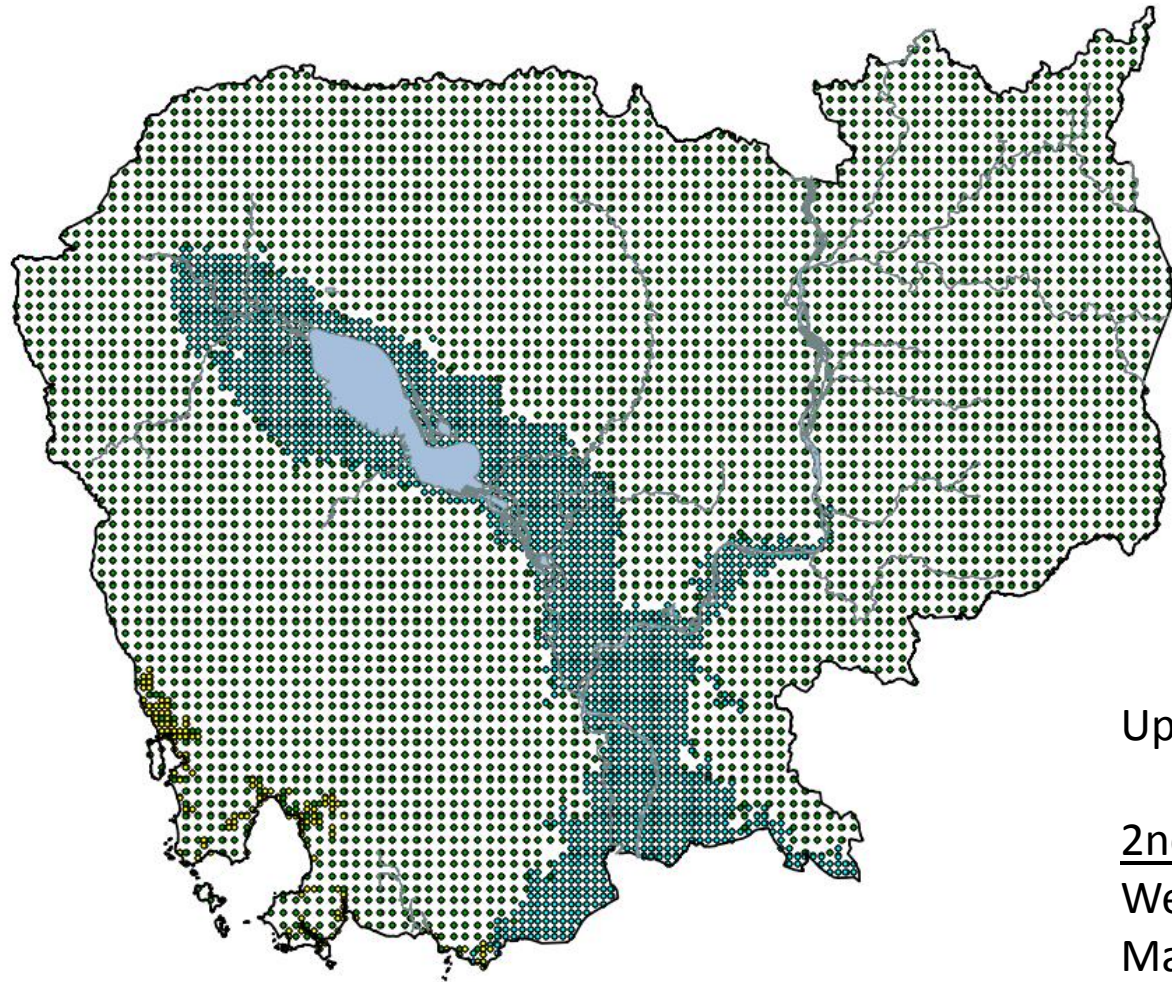


# Design of a National Forest Inventory (NFI) to develop emission and removal factors for REDD+ related activities

- Training on Allometric Equation development has been conducted.
- A Report and database existing allometric equations of Cambodia is available.
  - Different Allometric Equations can be accessed using [www.globalometree.org](http://www.globalometree.org) (although database of Cambodia need to be updated)
- Already available and accessible forest inventory data have been collected and stored in the REDD+ secretariat to support analysis and preparation of a NFI Design for Cambodia
- NFI Design proposal has been presented December 2013 during national consultation
- Subsequent work is undertaken on the NFI Manual (expected to be presented February 2014).



# Design Proposal of National Forest Inventory



Uplands: 6 km x 6 km

2nd phase

Wetlands: 4 km x 4 km

Mangroves: 3 km x 3 km

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# Thank You!

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