CAMBODIA REDD+ PROGRAMME

- **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**

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

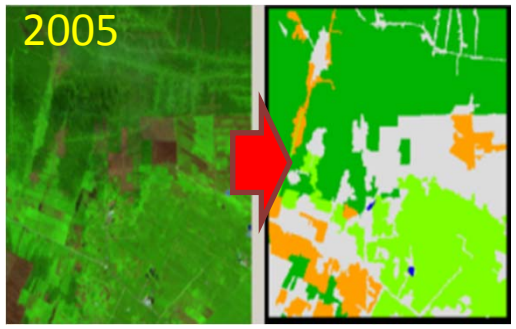
Practice:

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



CO_2

	FL Wet evergreen	FL Moist evergreen	FL Moist semi-deciduous	FL South-east subtype	FL North-west subtype	FL North-west subtype	FL Dry semi-deciduous	Agricultural land	Savanna	Shrub Ticket	Settlements	Wetlands	Other land	Unclassified	Final Area
FL Wet evergreen	51														51
FL Moist evergreen		42													42
FL Moist semi-deciduous			60												60
FL South-east subtype				52											52
FL North-west subtype					12										12
FL North-west subtype						2									2
FL Dry semi-deciduous							25		2						27
Agricultural land	5	2				2	3	1							13
Savanna			1			3	1		20						25
Shrub Ticket					1					12					13
Settlements						1		10			25				36
Wetland									0			2			2
Other land								5					25		30
Unclassified								9						10	19
Initial Area	56	44	61	52	13	8	29	25	22	12	25	17	25	10	
Net change (Δ = T0-T1)	-5	-2	-1	0	-1	-6	-2	-12	3	1	11	-15	5	9	0

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

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. tCO2e 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

Initiatives supporting implementation of the Cambodia

Outcome	Major Supporting Frameworks						
	UN-REDD	CAM-REDD	FCPF	FAO's TCP-NFI	LEAF	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	√√	√√	√	√√		√√	√

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**

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)					
		Savannah					
	Medium Elevation	Dense semi-deciduous Forest					
SUB-HUMID FORMATIONS		Mixed Deciduous Forest					
		Woodland with *Dipterocarpaceae*					
		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 *Borassus flabellifer*					

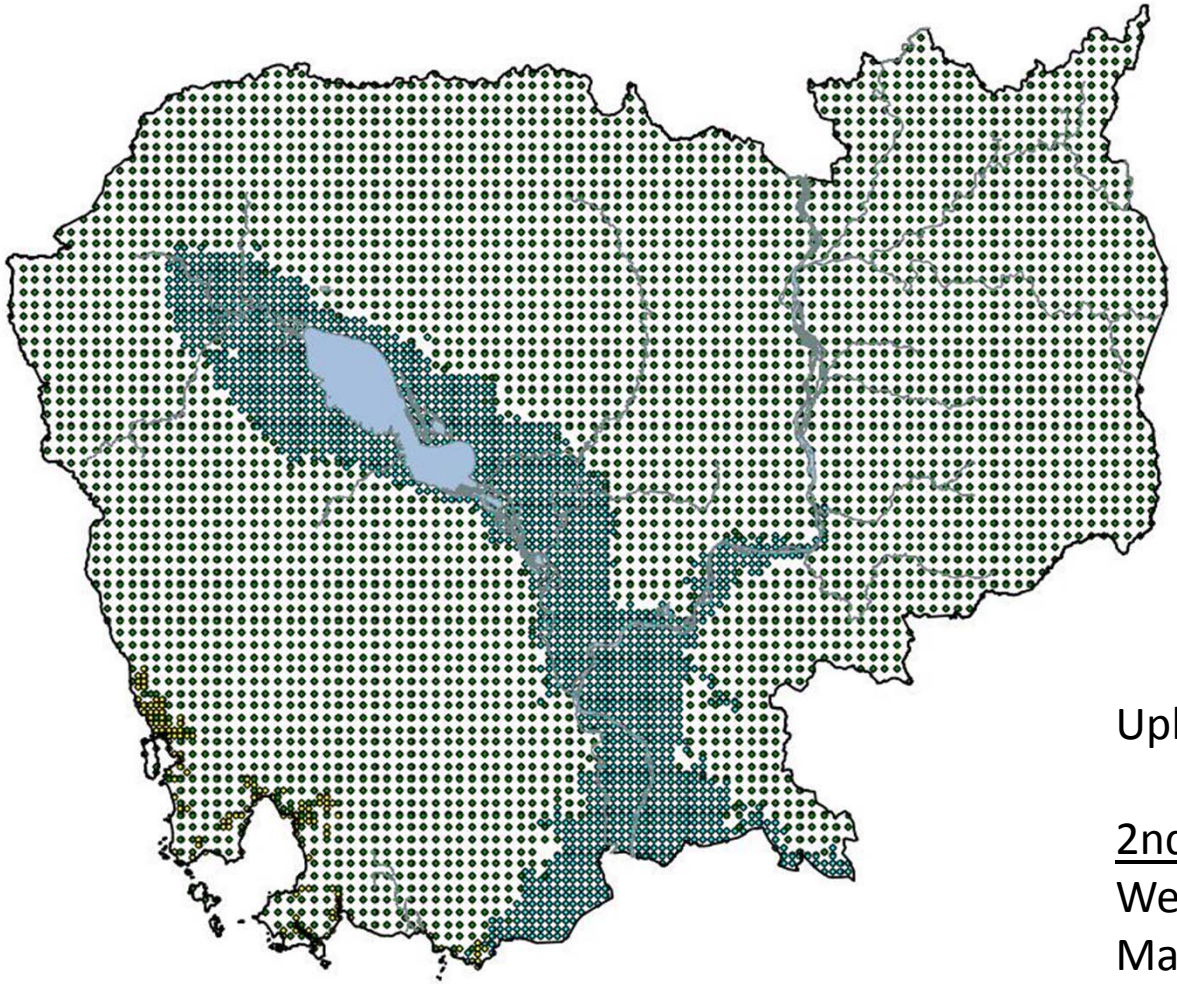
Review of the forest cover assessments to provide REDD+ activity data and design the satellite forest monitoring system (SLMS)

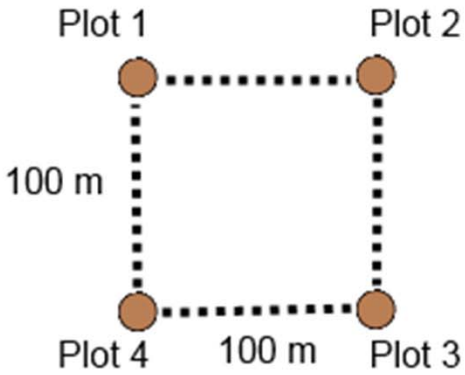
- A delegation of Cambodian technical specialist has been to INPe Brazil to complete a training on forest monitoring system.
- A inventory report on existing satellite and aerial imageries has been prepared
- Available Remote sensing and GIS data has been compiled, and a test version of satellite forest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

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.**globallometree**.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

<u>2nd phase</u>
Wetlands: 4 km x 4 km
Mangroves: 3 km x 3 km

Thank You!

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