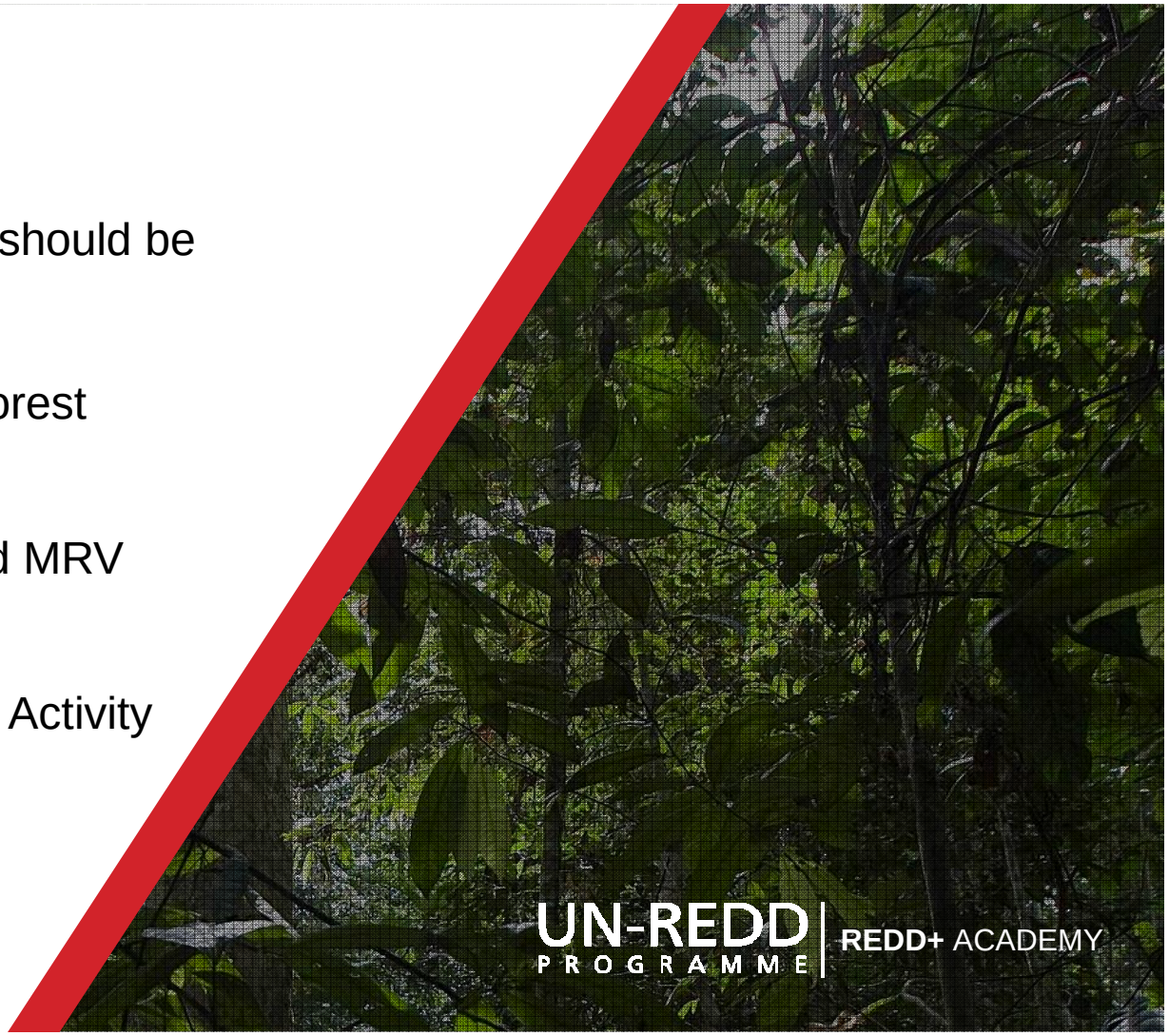
UN-REDD
PROGRAMME
REDD+ ACADEMY
5
National Forest Monitoring Systems

Learning objectives

By the end of this module, you should be able to:

- Define what is a National Forest Monitoring System
- Describe the Monitoring and MRV functions of the NFMS
- Understand the concepts of Activity Data and Emission Factors



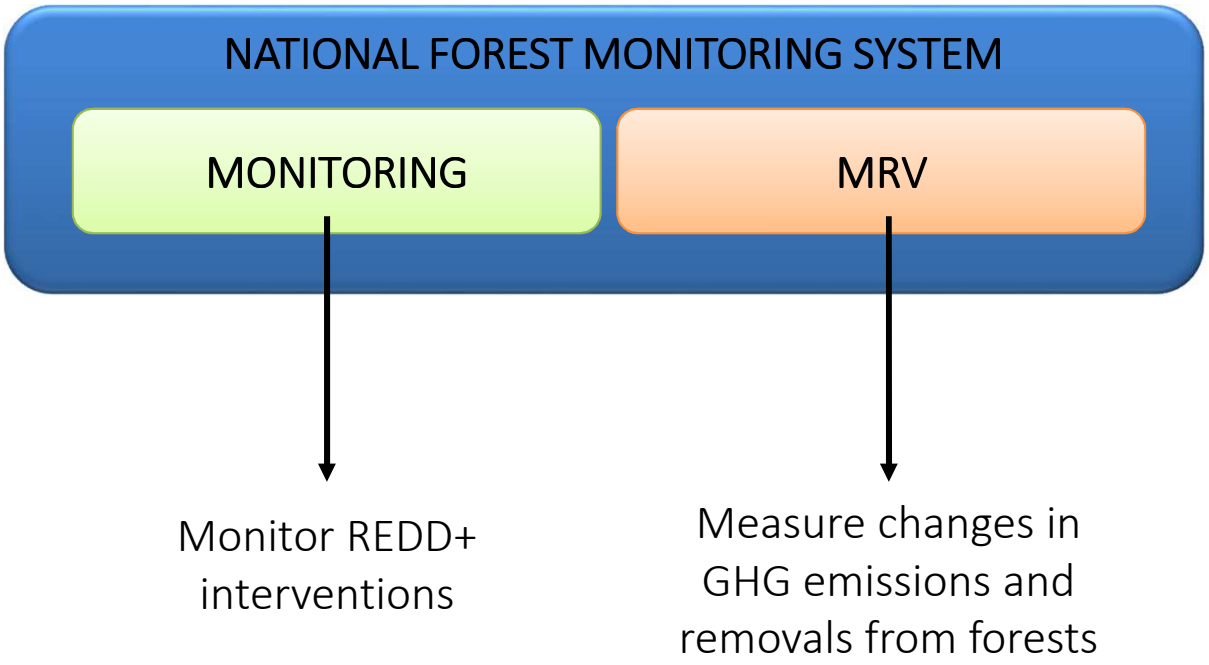
Agenda for the session

- Presentation of key aspects of an NFMS
- Q&A
- Group exercise

The NFMS…

- 1 of the 4 elements required by the UNFCCC
- Measures the climate change mitigation impact of REDD+ interventions
- Is closely related to the Forest Reference Emission Level(s)
- Can serve other purposes outside REDD+

What is an NFMS?



What is MRV?

- Measurement, Reporting and Verification
- A process to estimate GHG (reduced) emissions and (enhanced) removals resulting from the implementation of REDD+ activities

How does it work?

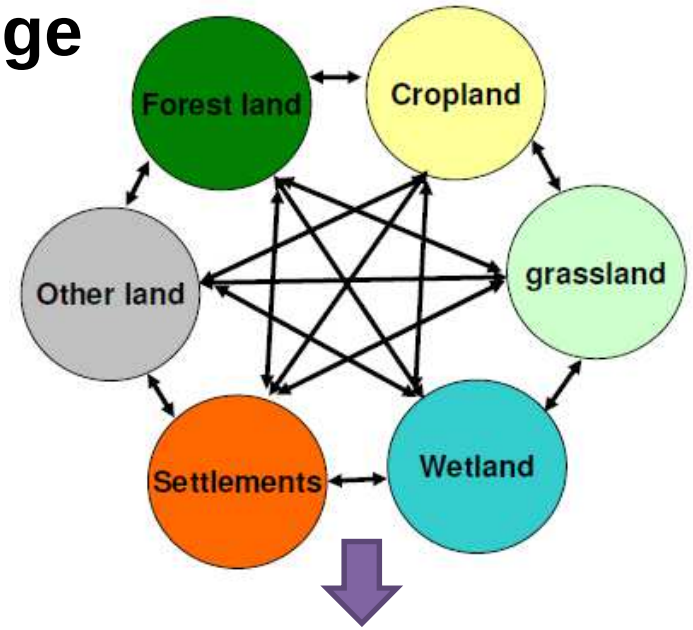
- There are international guidelines for estimating human GHG emissions and removals
  - Published by the Intergovernmental Panel on Climate Change (IPCC)
- Separate guidelines for different sources and sinks across a country, e.g.:
  - From transport, power stations, waste, agriculture and forestry

Activity Data: Area and Area Change

- Activity Data (AD) tells you:
  - How much land use change has taken place
  - What specific land use changes have taken place

How does it work?

- All land falls into one of 6 land use categories
  - Forest land, Cropland, Grassland, Wetland, Settlement, Other Land
- Use remote sensing / GIS to classify land
- Do this at two periods in time to calculate changes, e.g.
  - How much forest land in 2005 was still forest land in 2015?
  - How much forest land in 2005 was converted to cropland by 2015?



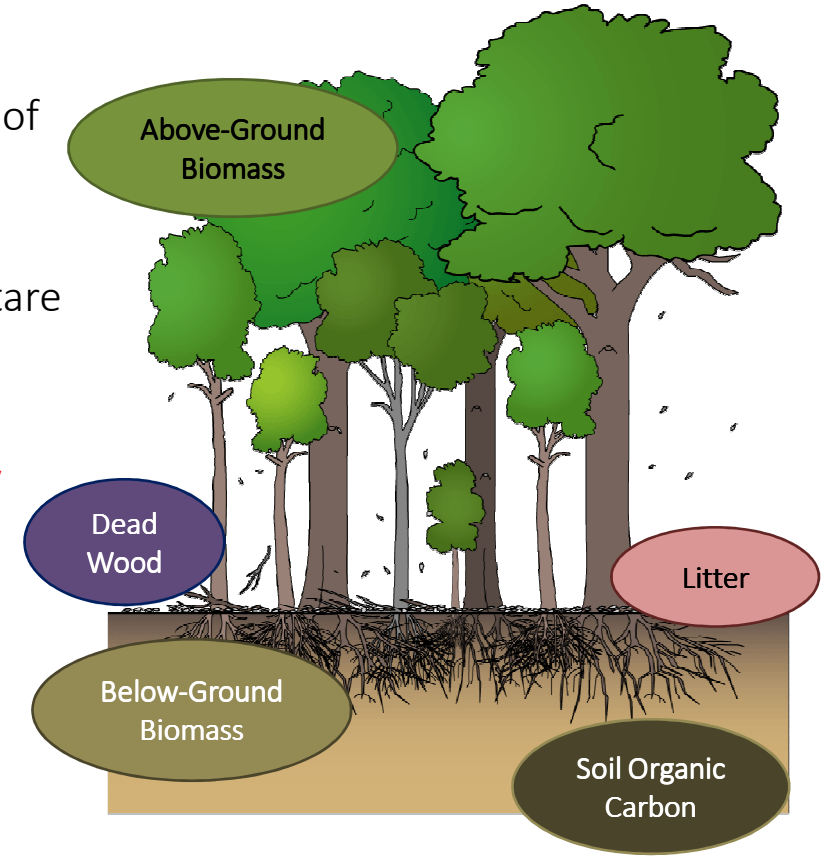
		Time 2					
		Crop	Grass	Wet	Settlen	Other	Forest
Time 1	Crop						
	Grass						
	Wet						
	Settlement						
	Other						
	Forest						

Emission Factors: Carbon Stocks & Changes

- Emission Factors (EF) tell you:
  - How much carbon was released from a hectare of human activity, e.g. forest land → cropland
- Removal Factors (RF) tell you:
  - How much carbon was sequestered from a hectare of human activity, e.g. cropland → forest land

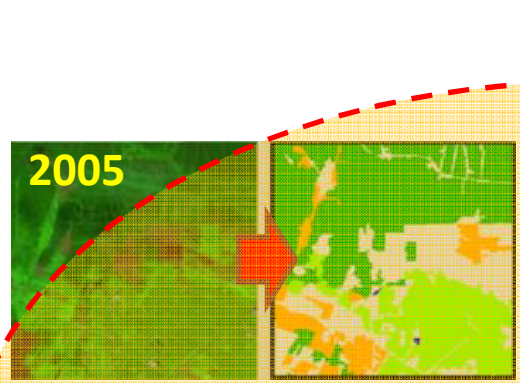
How does it work?

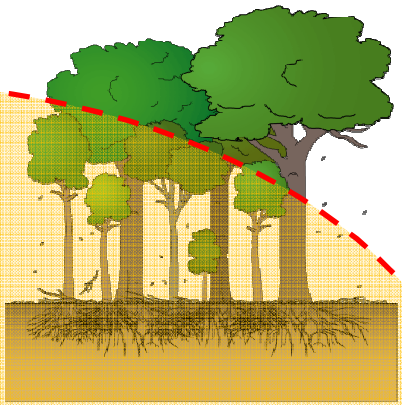
- Calculate the carbon stock in each land use category
  - Five carbon pools for forest land
  - Tools: ground-based inventories and research
- Apply appropriate EF or RF to each unit of AD
- IPCC provide "default" EFs and RFs



MRV for REDD+

IPCC Equation for Estimating Emissions & Removals





CO_2

	FL Wet evergreen	FL Moist evergreen	FL Moist semi-deciduous	FL South-east subtype	FL North-west subtype	FL Dry semi-deciduous	Savanna	Shrub Ticket	Settlements	Wetland	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						26	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					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	9

MEASUREMENT

Area change data from satellite remote sensing

Forest carbon stock change data from field-based inventory

Inventory of GHG **emissions & removals** from the forest sector

ACTIVITY DATA

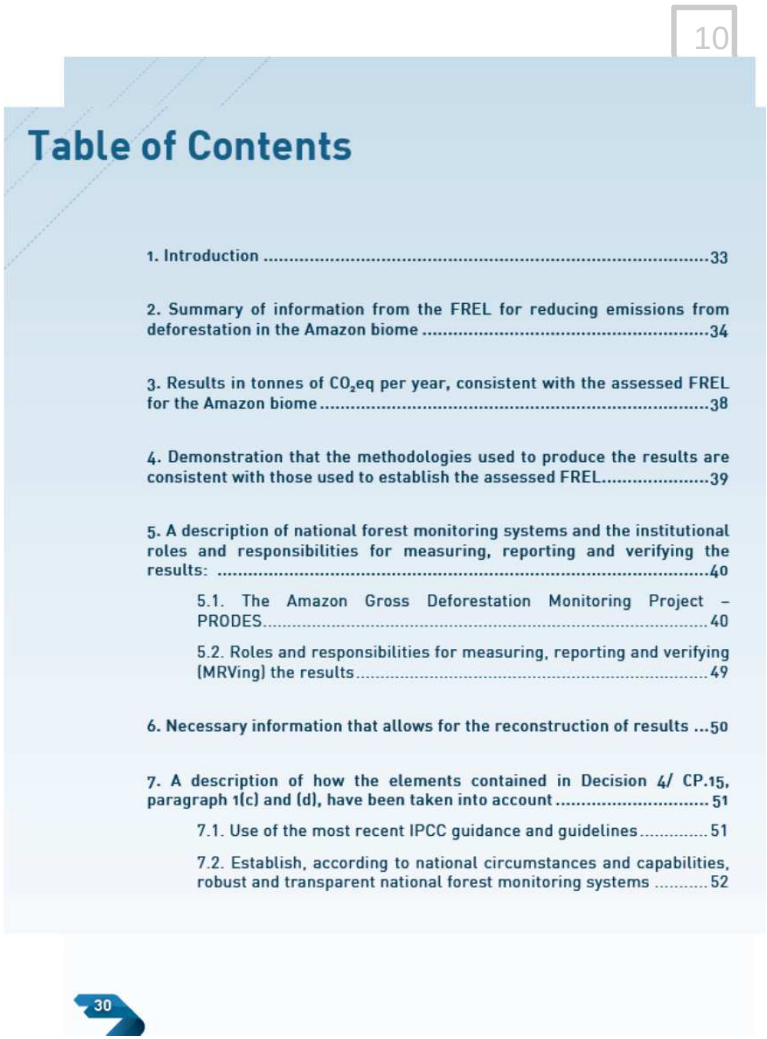
EMISSION FACTOR

EMISSIONS ESTIMATE

National Forest Monitoring Systems

Reporting for REDD+

- Countries will report REDD+ mitigation results to access REDD+ results-based finance
- Two channels for countries to report to the UNFCCC on REDD+:
  - National Communications
  - Biennial Update Reports (BUR)
- REDD+ results will be reported in a technical annex to the BUR
- REDD+ information will be posted on the UNFCCC REDD+ Web Platform
- Bhutan should appoint an official national REDD+ focal point to the UNFCCC



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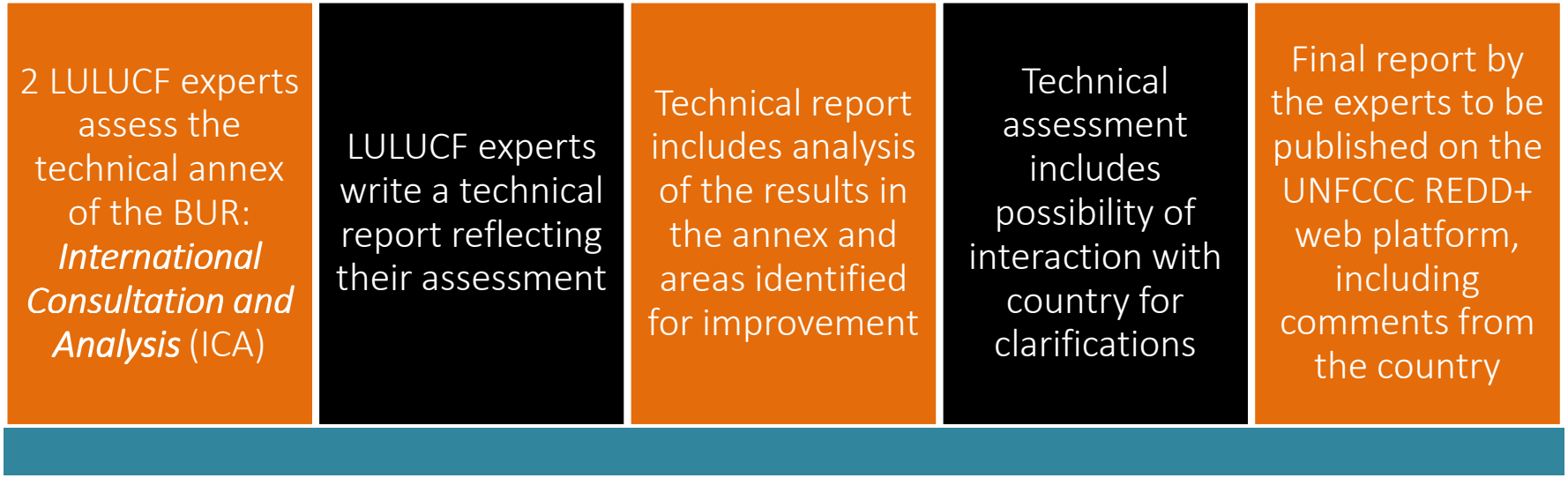
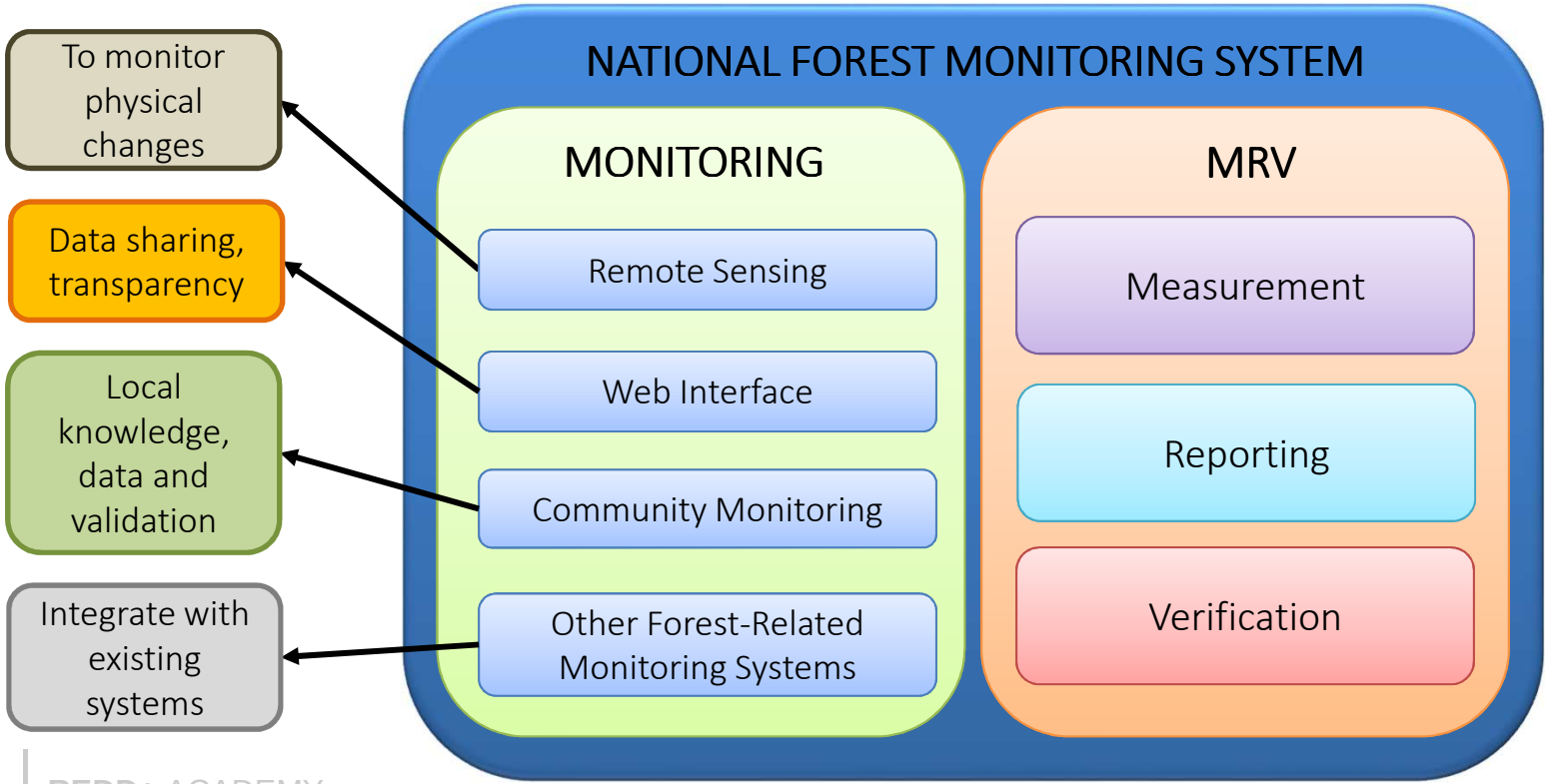
Verification for REDD+



MRV Overview

Forest Monitoring for REDD+



Key points

- National Forest Monitoring Systems have two functions
  - MRV
  - Monitoring for REDD+
- MRV is a process to estimate GHG emissions and removals
- Activity Data and Emission Factors are key data for MRV
- Forest monitoring for REDD+ can help assess whether interventions are working