

The UN-REDD Programme



About UN-REDD

- Collaborative partnership between FAO, UNDP, UNEP – a joint programme
- Works at international and national level supporting national capacities, providing technical guidance, and facilitating broad ranging consultations
- Governed by a Policy Board
- Collaborates with FCPF, FIP, UNFCCC, GEF, UNFF, other CPF members, NGOs and The REDD+ Partnership
- Supported by a compact, interagency Secretariat in Geneva

UN-REDD
PROGRAMME



National & Global Programmes

- 7 Work areas
- 25 partner countries, of which 9 pilot countries
 - National REDD+ Strategies and coordination
 - MRV and monitoring , stakeholder engagement, capacity building
- Global Programme, internat'l support functions
 - MRV and Monitoring
 - Governance
 - IP/CSO engagement
 - Equitable benefit sharing and livelihoods
 - Sector transformation
 - Multiple benefits
 - Knowledge management and sharing & coordination



FAO's contribution to the UN-REDD

- MRV and Monitoring
 - Global programme
 - Advise to countries
 - Backstopping the implementation of National Joint Programmers



MRV and Monitoring

- Measurement, Reporting and Verification.
 - SBSTA decision
 - To establish robust and transparent national forest monitoring systems [...] using a combination of remote sensing and ground-based forest carbon inventory approaches.
 - Monitoring systems should provide estimates [...] suitable for review as agreed by the COP.

UN-REDD develops MRV and M systems:

- Compliant with the UNFCCC:
 - Reporting principles
 - Consistency
 - Completeness
 - Comparability
 - Transparency
 - Accuracy
 - Methodological guidance under IPCC
 - Robust, cost-effective and verifiable
 - Reporting levels Tier 2 or Tier 3
- Synergized with other country development goals

Current REDD+ construction

Principles

Country-driven

**National
circumstances**

**Consistent with
development goals**

**Consistent with
adaptation needs**

**Equitable etc.
financing**

Results-based

Emission activities

Deforestation

Forest Degradation

Conservation

Sustainable management

Enhancement

Safeguards

Consistent

**Transparent &
Effective Governance**

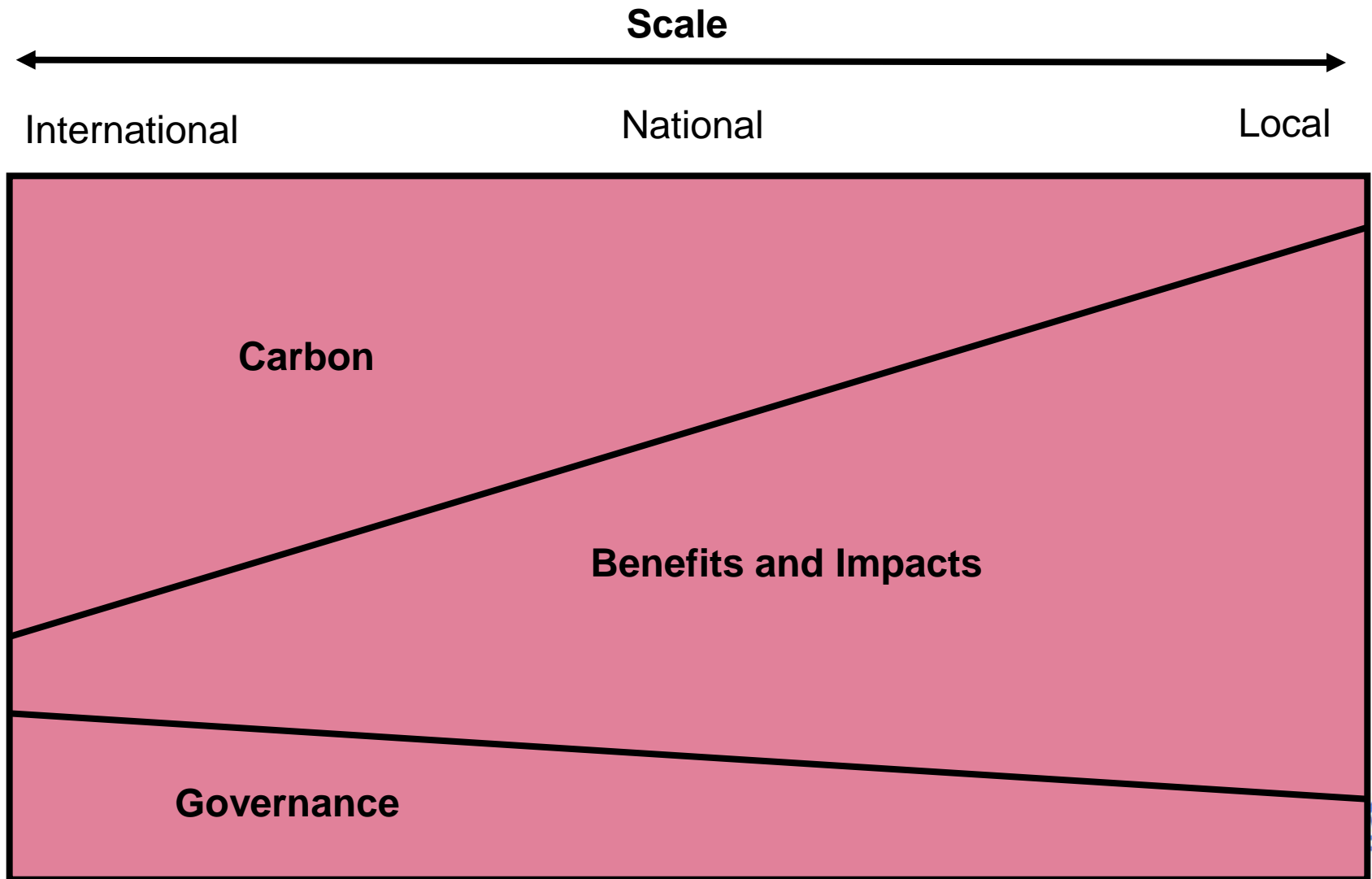
**Rights of
Communities**

**Stakeholder
Participation**

Conservation

Displacement

On the relative importance of REDD+ Monitoring categories



What is the scope of a “National Monitoring System for REDD+”?

	Carbon (Emission activities)	Benefits & Impacts (Services, Products)	Governance (Safeguards)
Strategic level (International commitments, National policies)	<p>Must have: High Accuracy, known Precision Expensive measurements -> Sampling approaches No need for full cover data</p>		
Operational level (In-country implementation)	<p>Must have: Complete coverage -> Payments/Enforcement Must be low cost per measurement -> Remote sensing No need for high accuracy -> instead: proxies</p>		

How to design and implement a “National Monitoring System for REDD+”?

	Carbon (Emission activities)	Benefits & Impacts (Services, Products)	Governance (Safeguards)
Strategic level (International commitments, National policies)	National Forest Inventory approach		Dedicated Governance Monitoring
Operational level (In-country implementation)	Monitoring for local implementation		

How to design and implement a “National Monitoring System for REDD+”?

	Carbon (Emission activities)	Benefits & Impacts (Services, Products)	Governance (Safeguards)
Strategic level (International commitments, National policies)			
Operational level (In-country implementation)			

Monitoring governance

What to Monitor

- draft framework -

3 core governance parameters

- **Clear and coherent policy, legal, institutional and regulatory frameworks**
 - e.g. land tenure/carbon ownership & use rights
- **Effective implementation, enforcement and compliance**
 - e.g. cooperative enforcement of REDD+ relevant laws
- **Transparent and accountable decision-making and institutions**
 - e.g. stakeholder participation in REDD+ design & implementation

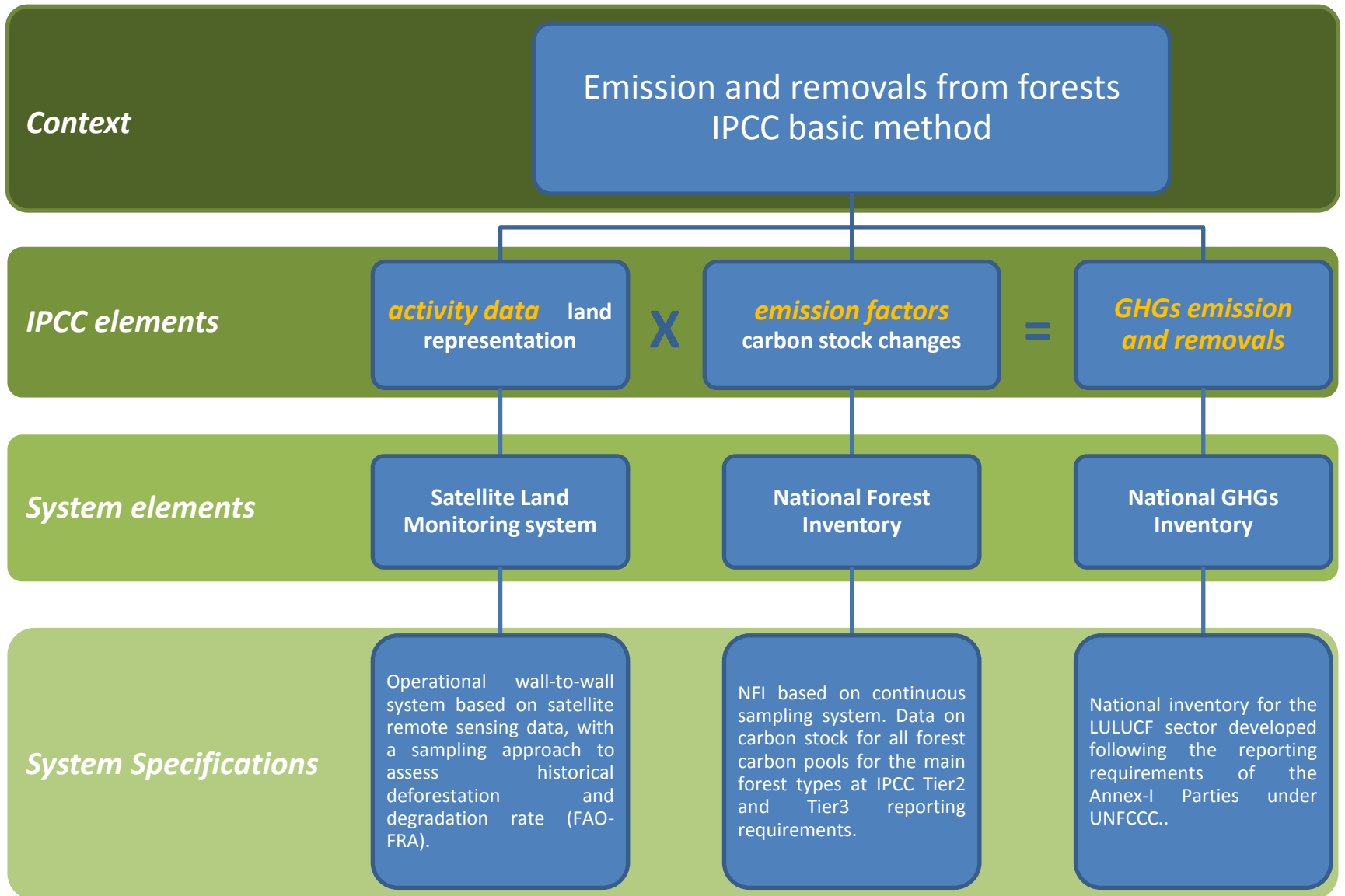
Current framework for safeguards monitoring under the convention

- Consistency with existing forest programmes and international agreements;
- Forest governance
- Rights of indigenous peoples and members of local communities;
- Participatory approach
- Conservation of natural resources and biological diversity;
- Permanence of mitigation actions;
- Leakage (to avoid it; engage as many countries as possible).

Governance of MRV

- MRV must be country lead
- Countries must have the institutions doing MRV
- MRV must be into the legal and administrative framework of the country

MRV basic elements under IPCC



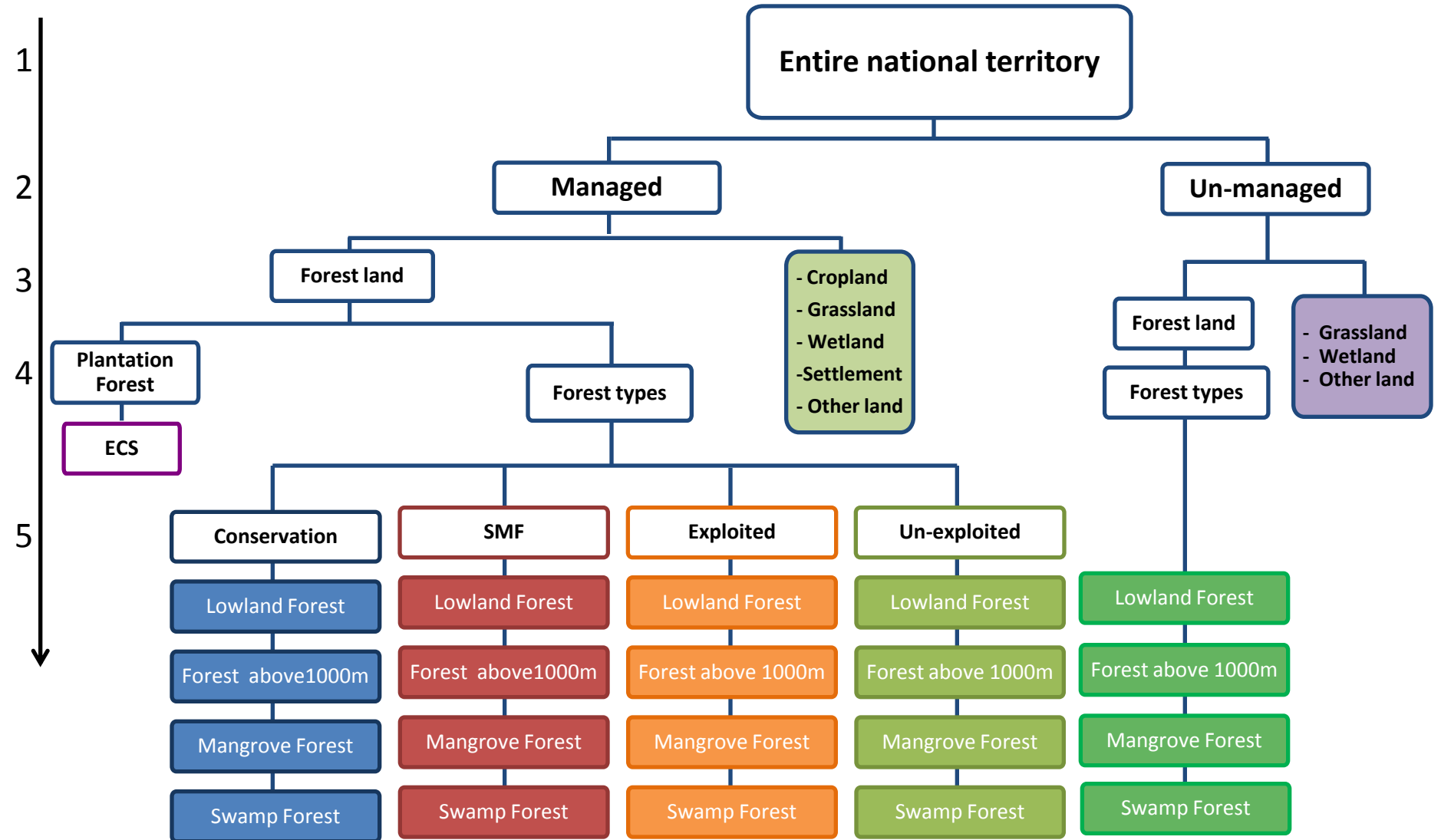
Activity Data

Definition

- ✓ Activity Data refers to the **area extent** of a land use category/subcategory and to its area **changes** on time (e.g. changes in land use area) (ha.yr^{-1}).

- ✓ To report on the area changes countries should stratify their territory into homogeneous land categories/subcategories.

Land stratification



Activity Data

✓ Countries need to adjust their classification systems to fit the IPCC land use categories.

- ✓ Forest land
- ✓ Cropland
- ✓ Grassland
- ✓ Wetland
- ✓ Settlements
- ✓ Other land

✓ Considerations regarding the conversion from land cover to land use.

Forest land	Bosque Nativo	Bosque siempre verde de tierras bajas de la Amazonía
		Bosque siempre verde de tierras bajas del Chocó
		Bosque Seco Pluvioestacional
		Bosque Siempreverde Andino de Pie de Monte
		Bosque Siempreverde Andino Montano
		Bosque Siempreverde Andino de Ceja Andina
		Bosque Seco Andino
		Manglar
Plantación forestal	Moretales	
	Protección	
Cropland	Cultivos anuales	Producción (agroforestería)
		Cultivos semipermanentes
		Cultivos permanentes
		Cultivos semipermanentes/permanentes
Grassland	Vegetación arbustiva (matorral)	Húmeda
		Seca
	Vegetación herbácea	Pasto natural
		Pasto cultivado
		Herbazales inundables de tierras bajas
		Turberas alto-Andinas
Mosaico (herbácea y arbustiva)	De frailejones	
	De pajonales	
	De almohadillas (completar categorías)	
Wetlands	Cuerpos de agua	Natural
		Artificial
Settlements	Zonas pobladas	Agroindustrial
		Social
		Transporte y comunicación
		Otros
Other land	Glaciares	Áreas erosionada
		Gravas
		Salina industrial
		Salina natural
		Playa
		Banco de arena

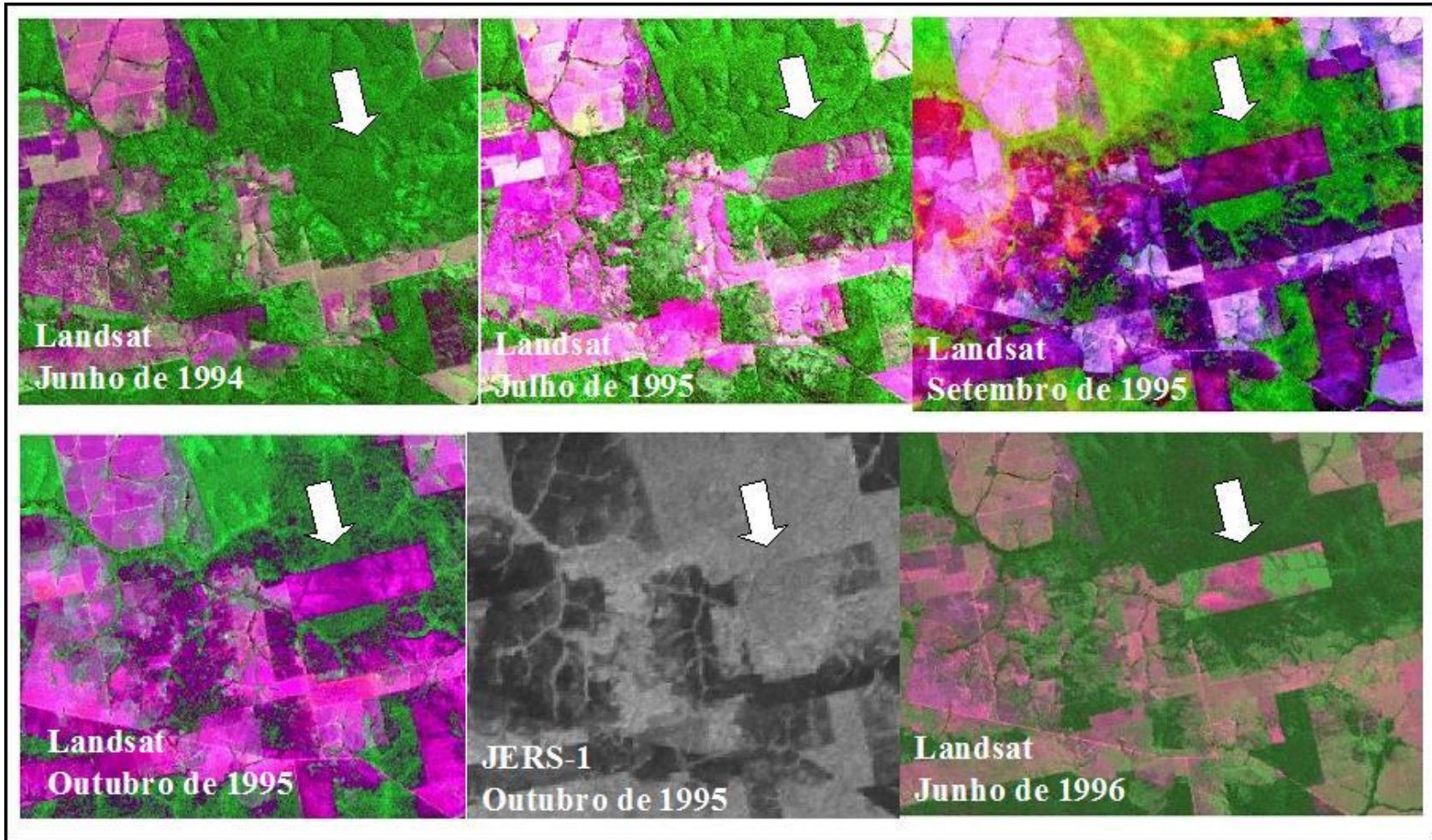
Approaches to obtain Activity Data (IPCC guidelines)

Approach 1: Net changes but no information on conversions nor on the spatial location of the changes.

Approach 2: Non-spatially explicit information of land use changes

Approach 3: Spatially explicit information on land use changes and the conversions among land uses.

Approaches to obtain Activity Data (IPCC guidelines)



Source: INPE

Approach 3: Spatially explicit information on land use changes and the conversions among land uses.

Remote Sensing Monitoring System

Initial / Final	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					3	1							13
Savanna			1				3	1	20						25
Shrub Ticket					1					12					13
Settlements						1					25				26
Wetland															
Other land															
Unclassified															
Initial Area	56	44	61	52	13	8									
Net change (Δ = T0-T1)	-5	-2	-1	0	-1	-6									

Land use changes
Deforestation



Initial / Final	Plantation area	Hill sanctuaries	Swamp sanctuaries	Provenance protection area	Special biological protection	Fire buffer zones	Shelterbelts	Cultural sites	Research area	Non Timber Forest Product	Timber production	Convalescence	Conversion forest	Final Area
Plantation area	5													5
Hill sanctuaries		2												2
Swamp sanctuaries			1											1
Provenance protection area				2										2
Special biological protection					5									5
Fire buffer zones						2								2
Shelterbelts,							4							4
Cultural sites								4						4
Research area	1					1			2					4
Non Timber Forest Product					2					2			2	6
Timber production											4			4
Convalescence												3		3
Conversion forest													9	9
Initial area	6	2	1	2	7	3	4	4	2	2	4	3	11	51
Net change (Δ = T0-T1)	-1	0	0	0	-2	-1	0	0	2	4	0	0	-2	0

Forest land that remains forest land
Degradation
Conservation
Sustainable management of forests
Enhancement of forest carbon stocks

FAO's approach for Activity Data: Operational Remote Sensing Monitoring System

**Country
Activity Data**

Satellite Forest Monitoring System

- Remote Sensing based
- Wall to wall coverage
- Approach 3
- IPCC guidelines compliance

Working
partnership
FAO - INPE

Training FAO-INPE

- Basics Remote Sensing
- Centralized training in Brazil on the Brazilian forest monitoring systems
- In-country training and follow-up
- No license costs
- Full autonomous operational forest monitoring system in the country

Success of Brazilian system with the Amazon Fund to be adapted and implemented to each country

National GHG Inventory based on conservative assumption

**Implementation supported by
predictable funding**

Open
source
system

FAO MRV
team
technical
support

Guiding principles of a Remote Sensing Forest Monitoring System

- Compliant with UNFCCC reporting for consistent land use representation
- Based on the successful proven operative satellite forest monitoring system and adapted to country's needs
- Cost-effective for annual national coverage
- Operational performance
- Wall-to wall based on multi-data approach
- Fully open source, no license costs/ dependency

Emission Factors

Definition

- ✓ Is a coefficient that quantifies the **emissions or removals** in areas undergoing human induced changes. ($\text{eqCO}_2\cdot\text{ha}^{-1}$)
- ✓ Emission factors are quantified **through changes in carbon stocks** in the pools considered by the IPCC.

IPCC has identified five carbon pools

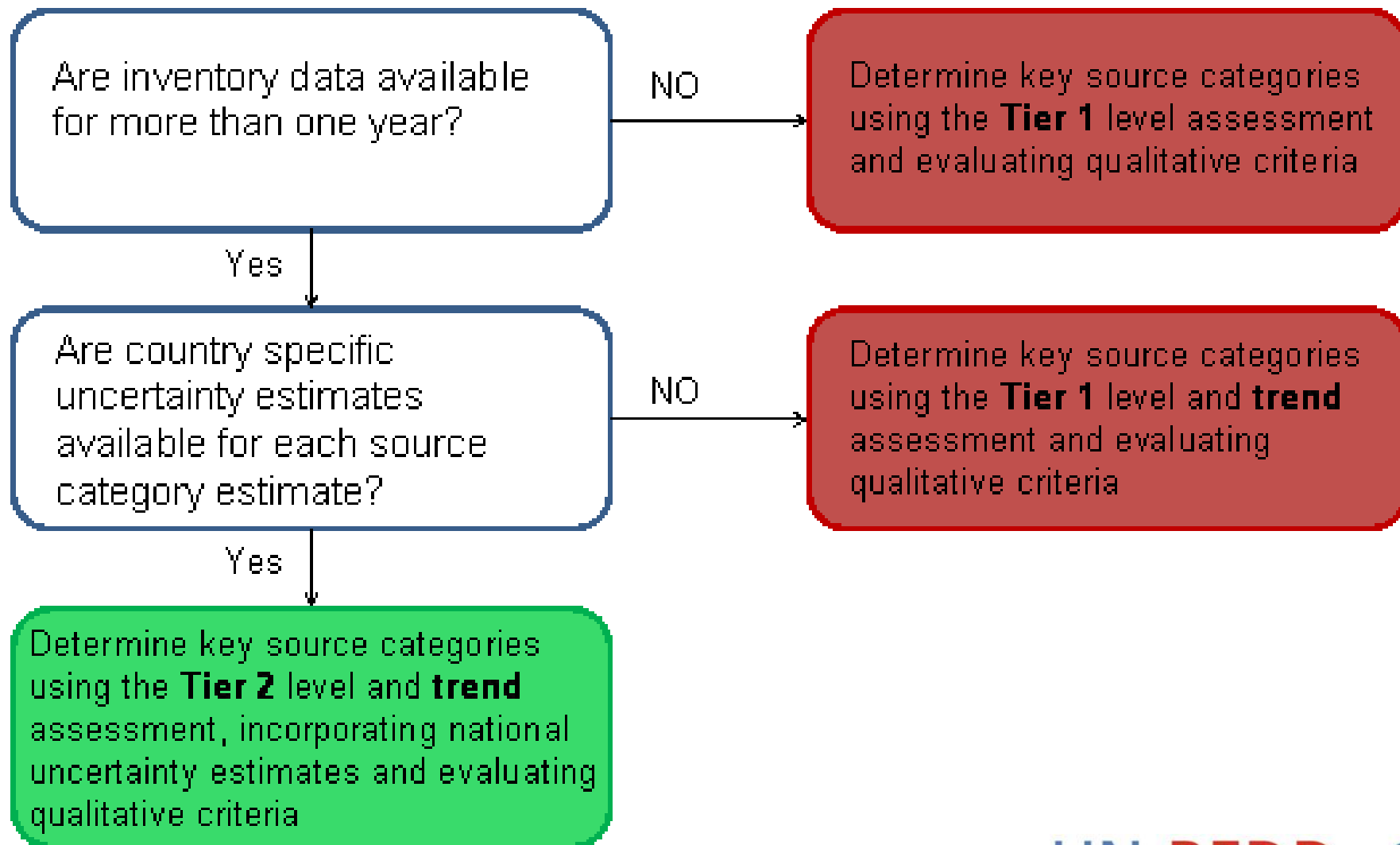


**Above-ground
biomass**

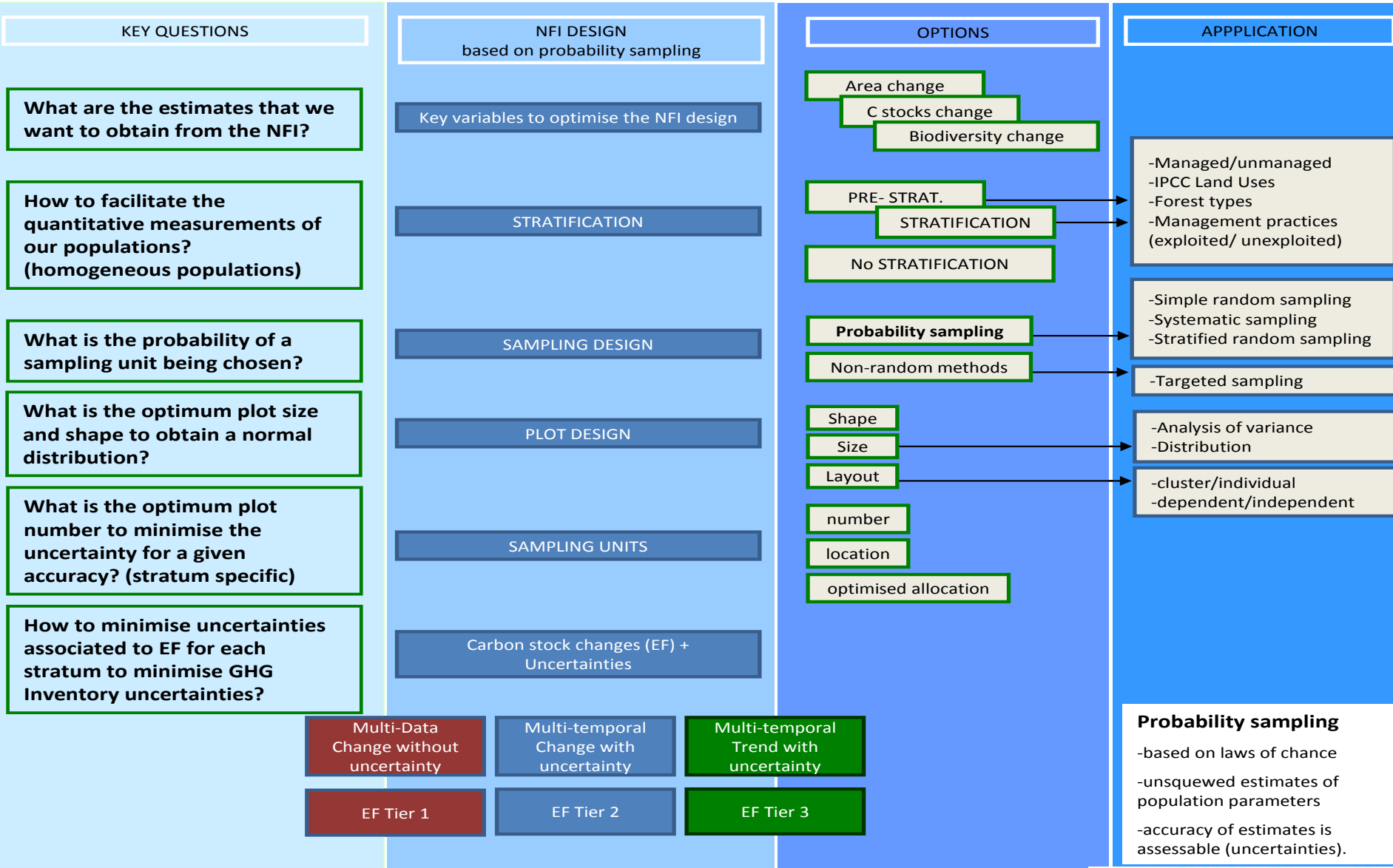
**Litter, dead wood
and soil organic matter**

**Below-ground
biomass**

TIER 2 requirement for UNFCCC reporting: Influence on the calculation of Emission Factors

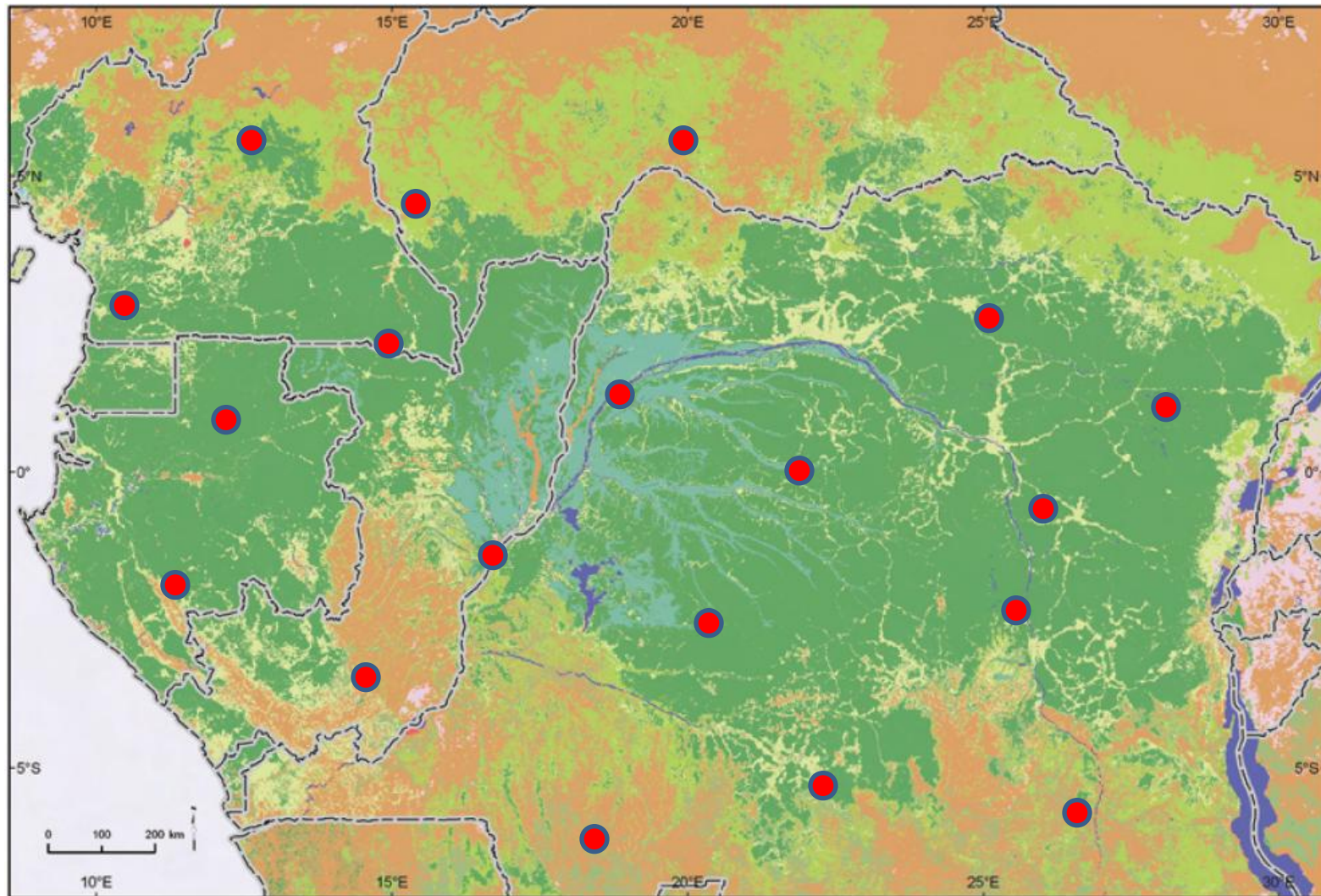


Considerations for NFI design and implementation



REDD+ MRV – Emission factors (changes in carbon stocks)

Field inventory measurement : where and how many plots?. **Cost-effectiveness**



Source: State of the Forest 2008 (2009)

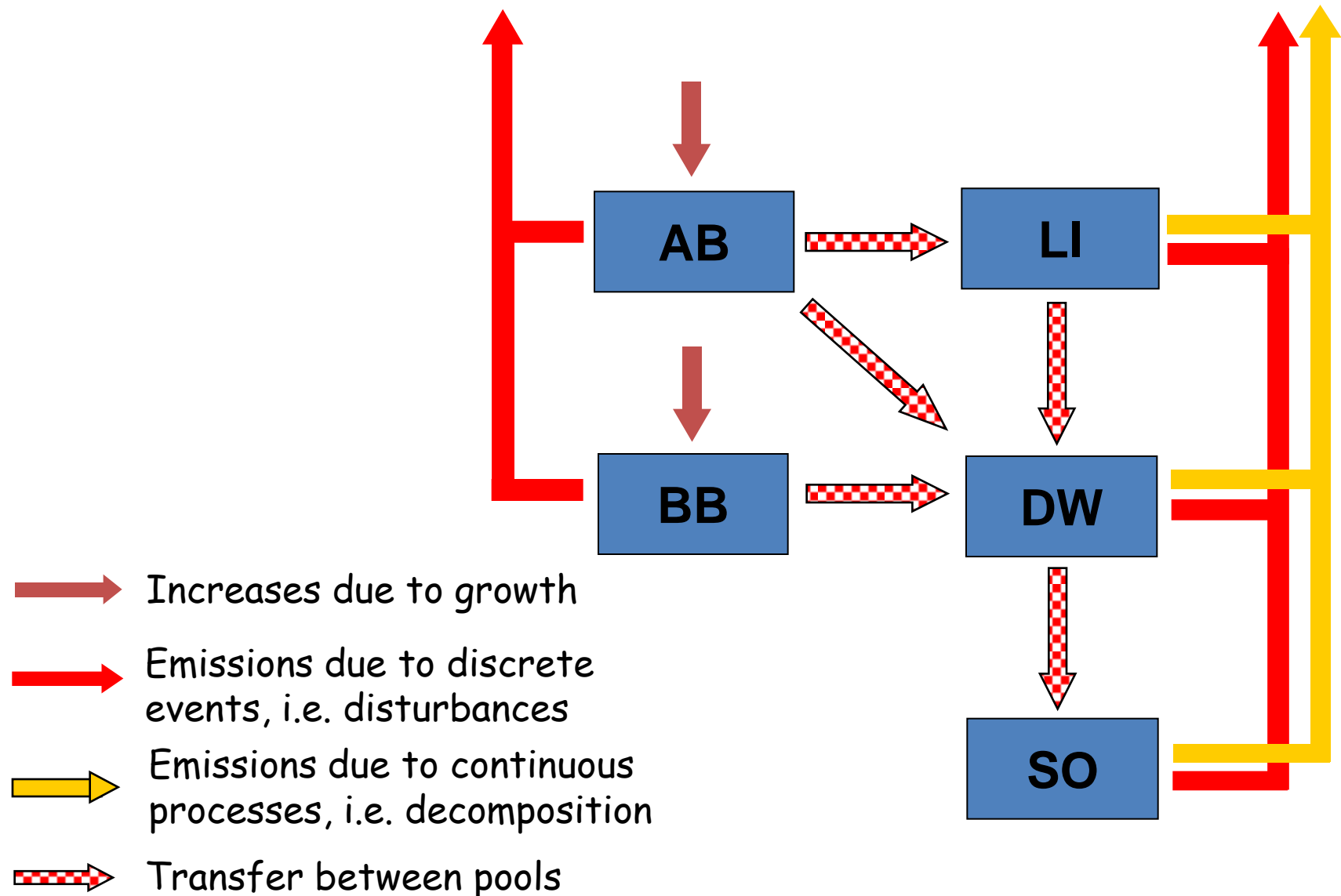
Example: Indian National Forest Inventory

- ✓ Stratification of the land into homogeneous and representative populations (e.g. physiographic zones + forest cover densities).
- ✓ Sampling scheme based on probability theory.
- ✓ National estimates obtained every two years through sampling of 10% of the national forest land (all the forest land is covered in 20 years)
- ✓ Highly decentralised forest administration with effective local implementation.
- ✓ Reliable estimates of country specific forest parameters (e.g. carbon stocks + carbon stock changes) + uncertainties (e.g. 22,000 plots per annum).
- ✓ Remote Sensing support to field observations and vice versa.

Carbon stock changes: three methods

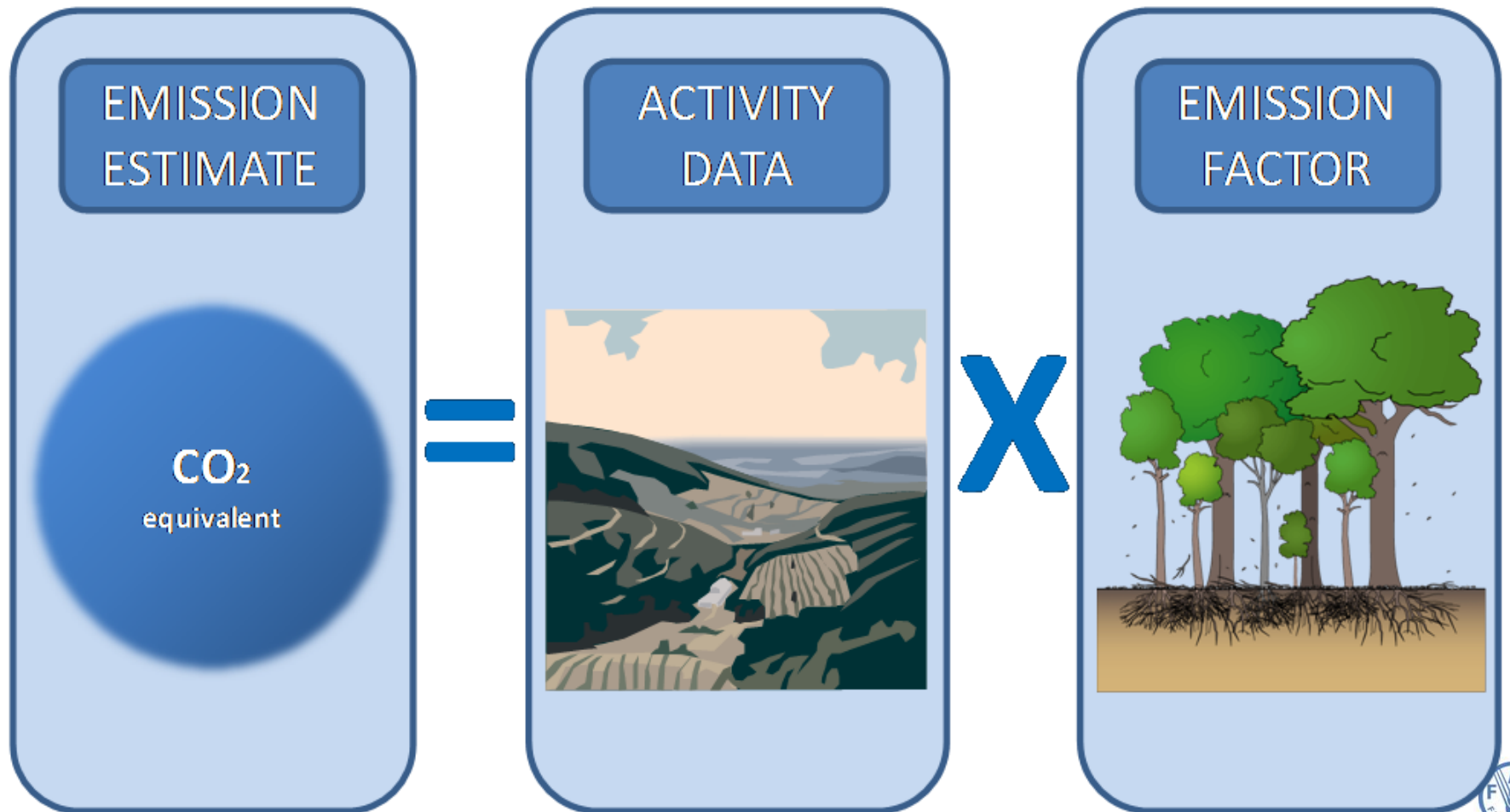
1. Gain-Loss (default) – TIER 1,2,3
2. Stock Difference – TIER 3
3. Country specific model – TIER 3

Changes = Gains – Losses (by pool)



GHG inventory for the LULUCF sector

Following Good practices and Guidelines of the Intergovernmental Panel on Climate Change (IPCC).



Greenhouse Gas Inventories under UNFCCC

✓ Article 4(1a) of the UNFCCC calls for its Parties to develop, periodically update and report “national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases, using comparable methodologies.

✓ Currently: Annex I countries are requested to submit annual comprehensive GHG inventories **under Tier 2 level and subjected to verification.**

Non-Annex I countries are requested to submit National Communications **without Tier demand and no verification.**

REDD+ reporting under the UNFCCC

✓ Reporting rules for REDD+ **have not been finalised** and will only be fixed when an agreement on REDD+ is in place.

✓ However, any REDD+ requirements for forest related GHG estimates will already be covered by a comprehensive national GHGs inventory

What to report for GHG Inventories for LULUCF?

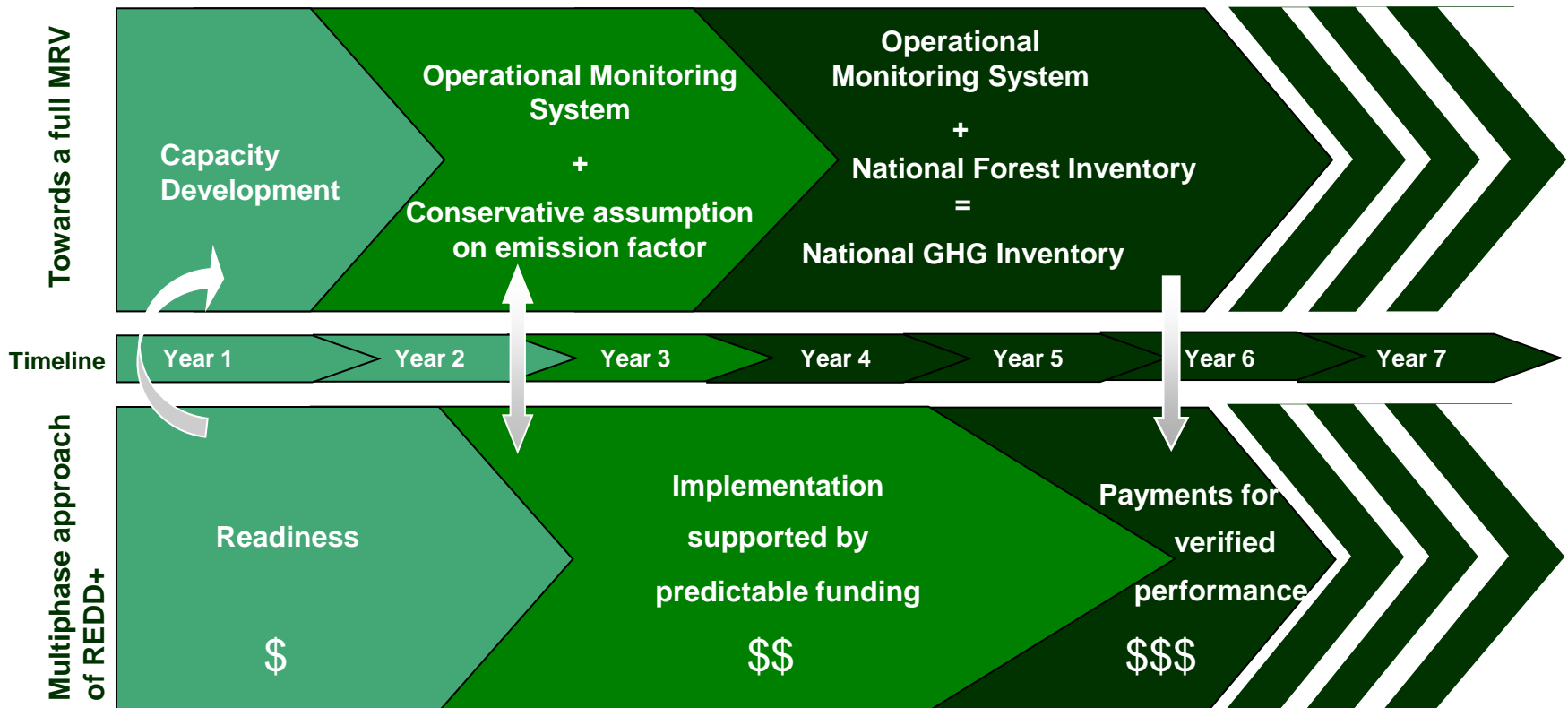
- CO₂ and other gases for areas that suffer from land use changes.
- IPCC's land use categories for emissions and removals.
- Greenhouse Gases and their Global Warming Potential (GWP).

IPCC CLASSIFICATION AND DEFINITION OF FOREST RELATED CATEGORIES OF EMISSIONS AND REMOVALS

Category Code and Name	Definition	Gases
3 B1 Forest Land	Emissions and removals from lands with woody vegetation consistent with thresholds used to define forest land in the national GHG inventory, sub-divided into managed and unmanaged, and possibly also by climatic region, soil type and vegetation type as appropriate. It also includes systems with vegetation that currently fall below, but are expected to later exceed, the threshold values used by a country to define the forest land category.	Annual reporting Equivalents of CO ₂ through GWP
3 B1a Forest Land Remaining Forest Land	Emissions and removals from managed forests and plantations which have always been under forest land use or other land categories converted to forest over 20 years ago (default assumption).	CO ₂ ,CH ₄ N ₂ O,NO _x CO, SO ₂ NMVOC
3 B1b Land Converted to Forest Land	Emissions and removals from lands converted to forest land. Includes conversion of cropland, grassland, wetlands, settlements, and other land to forest land. Even abandoned lands which are regenerating to forest due to human activities are also included.	CO ₂ ,CH ₄ N ₂ O,NO _x CO, SO ₂ NMVOC,
3 C1 Emissions from Biomass Burning	Emissions from biomass burning that include N ₂ O and CH ₄ .CO ₂ emissions are included here only if emissions are not included in 3B categories as carbon stock changes.	CO ₂ ,CH ₄ N ₂ O,NO _x
3 D1 Harvested Wood Products	CO ₂ net emissions or removals resulting from Harvest Wood Products.	CO ₂
3 D2 Other (please specify)	e.g. Emissions and removals from forest land affected by hurricanes	

Forest Land						Inventory 2007	Submission 2009	ITALY	
GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS						
Land-Use Category	Sub-division ⁽¹⁾	Area ⁽²⁾ (kha)	Carbon stock change in living biomass per area ^{(3) (4)}			Net carbon stock change in dead organic matter per area ⁽⁴⁾	Net carbon stock change in soils per area ⁽⁴⁾		Net CO ₂ emissions/removals ^{(8) (9)}
			Gains	Losses	Net change		Mineral soils ⁽⁵⁾	Organic soils	
			(Mg C/ha)						
A. Total Forest Land		10,879.12	2.50	-1.92	0.58	0.13	0.68	NO	-55,588.35
1. Forest Land remaining Forest Land		10,782.32	2.50	-1.92	0.58	0.13	0.64	NO	-53,384.43
	stands - norway spruce	533.27	1.63	-1.44	0.19	0.05	0.49	NO	-1,441.27
	stands - silver fir	90.11	2.13	-1.73	0.39	0.10	0.56	NO	-348.98
	stands - larches	343.74	1.76	-1.26	0.49	0.12	0.62	NO	-1,552.55
	stands - mountain pines	375.52	3.92	-2.69	1.23	0.27	0.76	NO	-3,109.93
	stands - mediterranean pine	151.80	4.69	-3.54	1.15	0.26	0.77	NO	-1,216.15
	stands - other conifers	33.87	2.69	-1.61	1.08	0.25	0.80	NO	-263.76
	stands - european beech	425.28	5.51	-5.50	0.01	0.09	0.05	NO	-255.55
	stands - turkey oak	141.28	3.09	-2.86	0.22	0.11	0.22	NO	-285.10
	stands - other oaks	261.20	2.39	-2.33	0.06	0.09	0.09	NO	-227.92
	stands - other broadleaves	402.71	2.41	-2.10	0.31	0.11	0.29	NO	-1,051.22
	coppices - european beech	578.02	2.30	-1.77	0.53	0.14	0.77	NO	-3,071.58
	coppices - sweet chestnut	645.00	6.01	-3.29	2.72	0.32	1.30	NO	-10,274.61
	coppices - hornbeams	541.89	1.09	-0.92	0.17	0.10	0.63	NO	-1,797.17
	coppices - other oaks	973.53	1.52	-1.20	0.32	0.12	0.66	NO	-3,913.42
	coppices - turkey oak	473.54	1.45	-1.38	0.07	0.09	0.56	NO	-1,247.41
	coppices - evergreen oaks	259.13	2.72	-2.60	0.12	0.10	0.57	NO	-746.87
	coppices - other broadleaves	1,100.75	3.11	-1.77	1.34	0.21	0.97	NO	-10,165.40
	coppices - conifers	143.69	2.72	-1.60	1.12	0.26	0.82	NO	-1,154.59
	plantations - eucalyptuses c	1.10	4.37	-4.52	-0.15	0.08	0.46	NO	-1.60
	plantations - other broadleaves	3.40	3.48	-3.09	0.39	0.08	0.71	NO	-14.78
	plantations - poplar stands	140.73	3.58	-1.81	1.77	0.05	1.44	NO	-1,679.13
	plantations - other broadleaves	14.97	2.22	-1.77	0.45	0.08	0.40	NO	-51.26
	plantations - conifers stands	10.29	6.84	-4.08	2.76	0.17	1.39	NO	-163.15
	plantations - others	195.13	6.31	-5.02	1.29	0.05	1.08	NO	-1,734.32
	protective forests - rupicolo	715.09	2.51	-2.08	0.43	0.12	0.52	NO	-2,795.64
	protective forests - riparian	143.57	2.62	-2.25	0.37	0.15	0.34	NO	-456.02
	protective forests - shrubland	1,851.04	1.65	-1.66	0.00	0.09	0.56	NO	-4,385.25
	unstocked forest area	234.67	NA	NA	NA	NA	NO	NO	NA,NO

Multiphase implementation of REDD+ through MRV

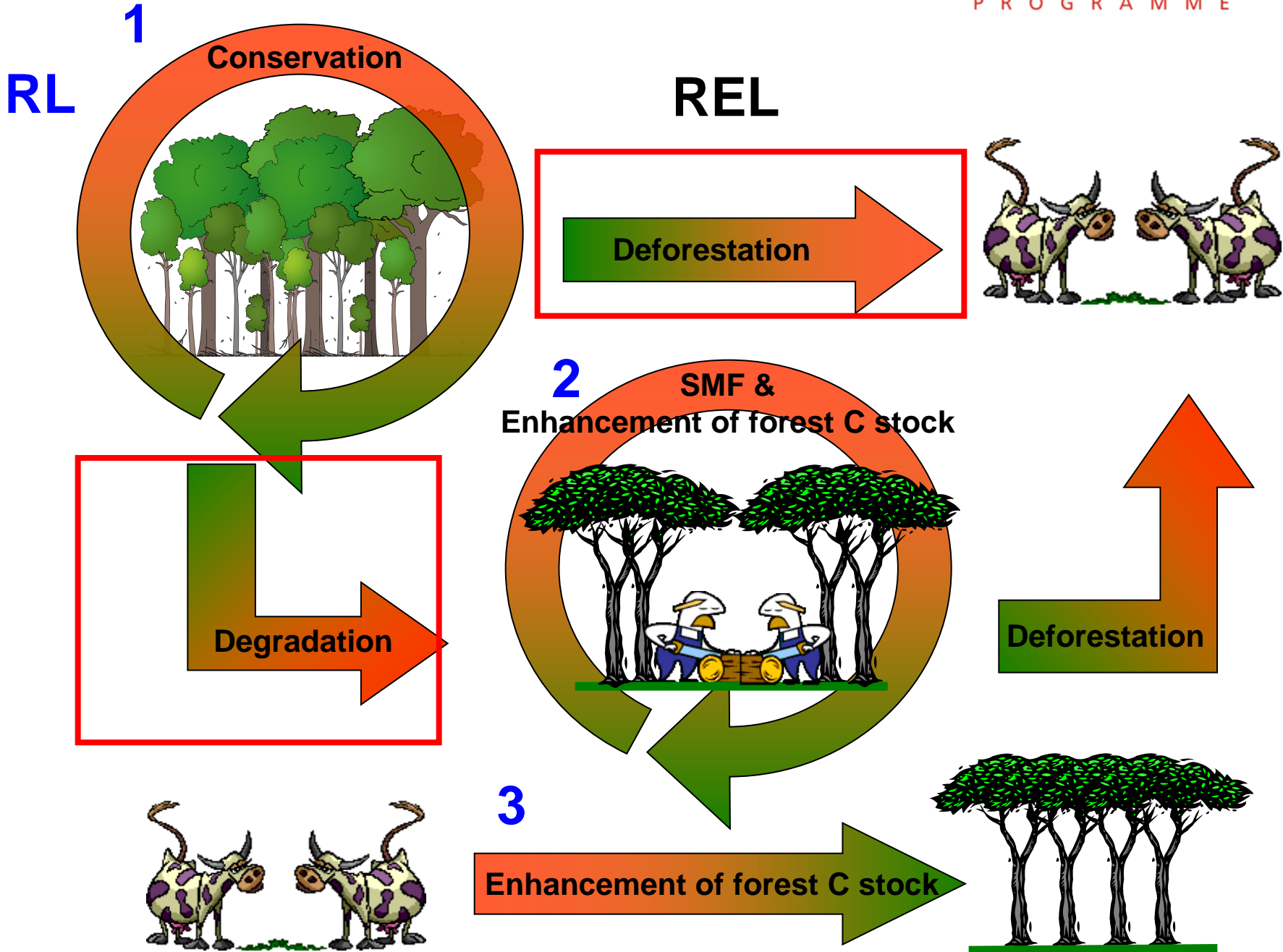


Reference Emission Levels

Reference Levels

The reference emission level (REL) is the amount of gross emissions from a geographical area estimated within a reference time period (eqCO₂). REDD+ activities related to emissions.

The reference level (RL) is the amount of net/gross emissions and removals from a geographical area estimated within a reference time period (eqCO₂). It also includes REDD+ activities related to absorptions.



REL/RL is based on historical data adjusted for national circumstances

Historic deforestation rate (ha.yr⁻¹) (*baseline of deforestation*)
X
Emission factors (eqCO₂.ha⁻¹)



Historic emission rates x Years (eqCO₂) (*reference scenarios*)
+
National Circumstances (deforestation projections as part of
national circumstances negotiations)



Reference emission level/ Reference level (eqCO₂)

REDD+ reporting under the UNFCCC

- ✓ REDD+ will most probably be an activity-based mechanism, covering five forest mitigation activities.
- ✓ As it is the case for reporting under the Kyoto Protocol, REDD+ reporting rules may not require countries to report on all the forest land nor on all five forestry activities defined under REDD+.
- ✓ However for REDD+ reporting, it is expected a more comprehensive approach in order to apply the **principle of “environmental integrity”** to avoid “displacement of emissions” (the removal of emissions in one place should not result in an increase of emissions elsewhere).