MRV rules related to forestry and land use under Paris agreement and challenges in China

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1. Introduction of MRV and ETF under Convention and Paris Agreement

1.1 Background of Measure Report and Verification

The United Nations Framework Convention on Climate Change, which was adopted in 1992 and entered into force in 1994, laid the foundation for the current system of reporting of information related to its implementation.

Information on greenhouse gas (GHG) emissions by sources and removals by sinks, as well as on the actions that Parties are taking to mitigate and adapt to climate change and to implement the Convention, is key in determining the progress in the implementation of the Convention, both internationally and at the national level.

COP26 in finished all of negotiation of Paris agreement rule books including market,non-market and international cooperation mechanism . MRV are key pillars to promote implementation to convention and Paris Agreement during process of implementation of Paris Agreement

1.2 Key elements of the MRV framework for the developing countries under convention

International MRV

National communications
- Measurement of GHG emissions
- and sinks (GHG inventory)
- Steps to implement Convention

Biannual updated reports (BURs)
- GHG inventory report
- Measurement of mitigation actions
- and their effects
- Reporting on domestic MRV system
- Needs and support received

International consultant and analysis (ICA)
- Technical analysis of the BURs
- Facilitative sharing of views

Domestic MRV

Determine arrangements for domestic MRV of domestically supported Actions (voluntary)

Report on domestic MRV in the BUR

MRV for REDD plus (voluntary)

Report REDD-plus results in a technical annex to the BUR
- Applies to Parties seeking to obtain and receive payments for results-based actions

The process of MRV, which started at COP 13 in 2007, resulted in a few key milestones at COP 16 in 2010 for developing countries

- Enhancing reporting in national communications, including GHG inventories
- Parties on mitigation actions and their effects, and support received;
- Submitting BURs every two years;
- Conducting ICA of BURs that aims to increase the transparency of mitigation actions and their effects;
- Subjecting both domestically and internationally supported mitigation actions to domestic MRV
- For those non-Annex I Parties that voluntarily implement REDD-plus activities and wish to take the opportunity of a results-based payment, international
- guidance on MRV for REDD-plus activities applies.

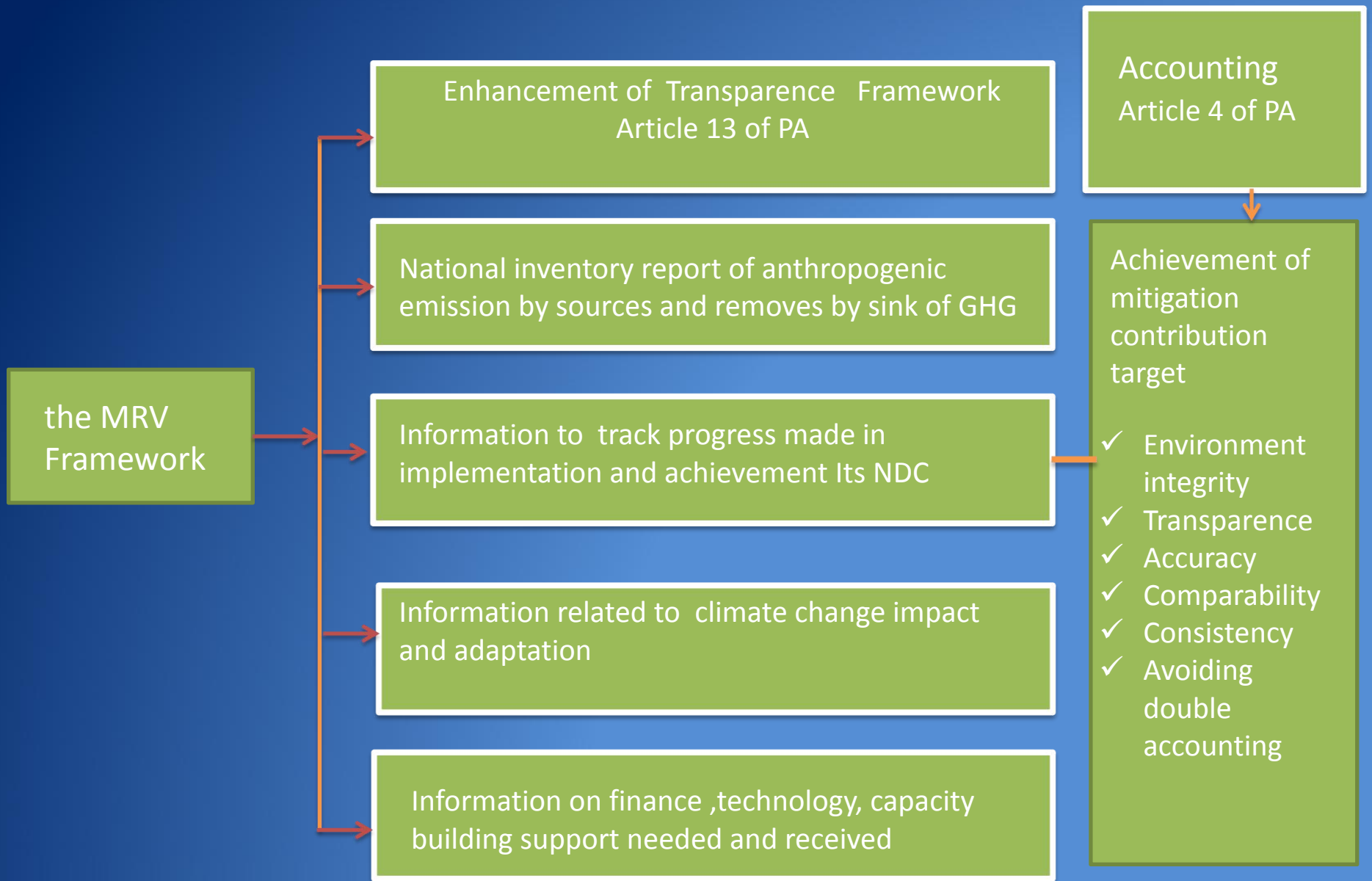
1.3 Enhancement transparence Framework (ETF) under Paris Agreement

Paris Agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects and established the Enhanced Transparency Framework to enable tracking, comparing and understanding these national commitments.

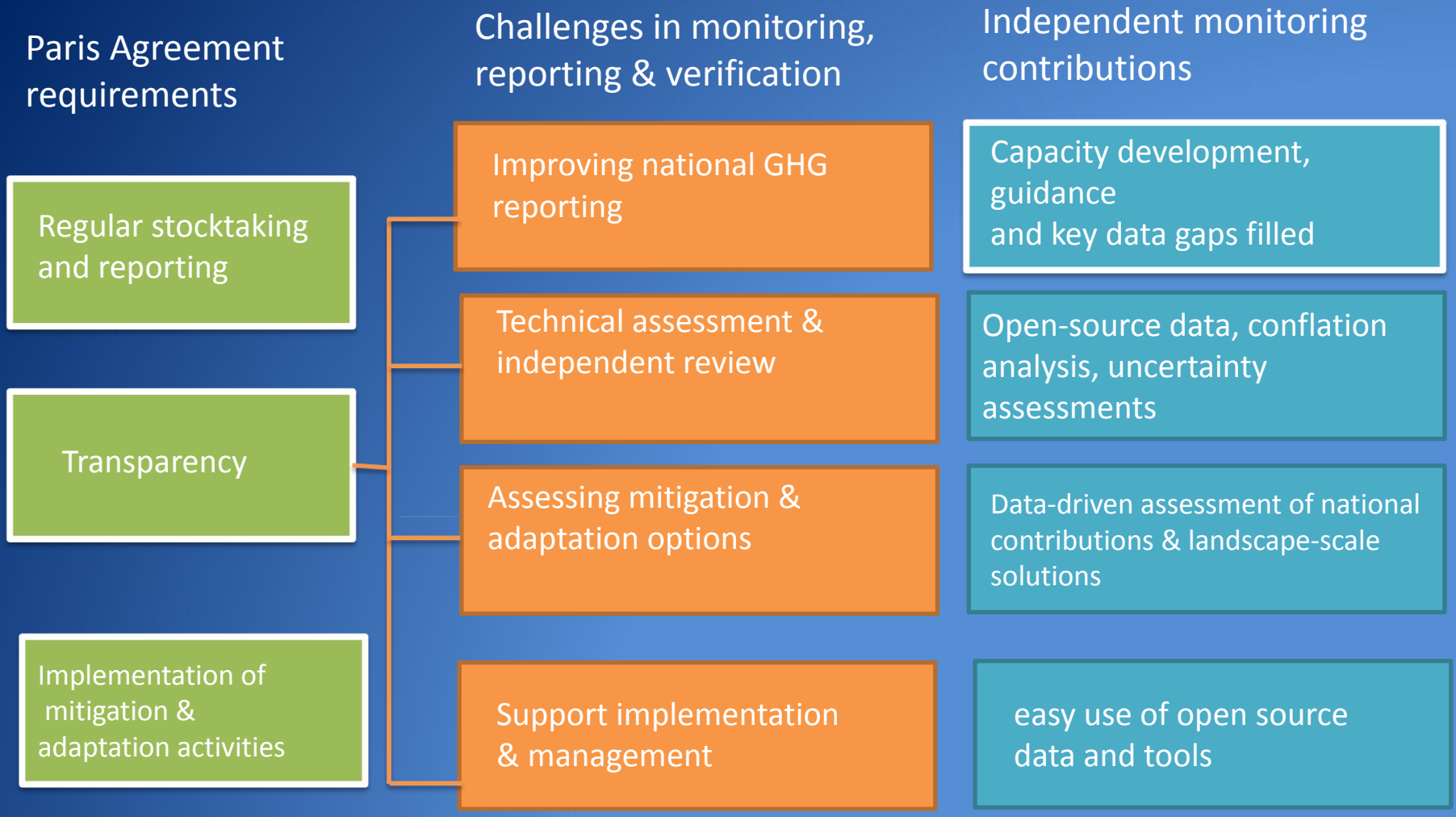
Under the Paris Agreement, only two concepts – namely transparency and accounting – have a role to play. The ETF and its MPGs will build upon the existing MRV framework and the experiences gained there under and will ultimately supersede the framework. The only features of MRV remaining will be those elements of the existing MRV framework that end up being retained and/or enhanced under the ETF MPGs

While accounting does not form part of the ETF, it is defined in a separate article of the Paris Agreement. The ETF can, be understood to have a strong link to accounting in that it provides the information necessary to track progress towards the achievement of NDCs according to *Article 4*, where accounting is defined. The exact nature of this information remains to be determined for the ETF MPGs, the accounting guidelines and potentially also the guidelines for the avoidance of double counting.

Enhancement of transparence Framework(ETF) and Accounting



Requirements Challenges and Monitoring in ETF of Paris Agreement



2. Methodologies of Forest and Land use in ETF of Paris Agreement

2.1 Forest and Land use in NDC

AFOLU represents 20-24% of net anthropogenic emissions, equivalent to 10-12GtCO_2 eq/yr (AR5 – based on the 2010 GHG inventory datasets).
A significant proportion of GHG emissions/removals in the AFOLU sector come from developing countries.

Paris Agreement requires all countries to put forward nationally determined contributions (NDCs) to fight climate change. Many countries have included agriculture, forestry and other land-use (AFOLU) targets in their NDCs.

They will need to account for anthropogenic emissions and removals from the AFOLU sector in a manner that promotes environmental integrity, transparency, accuracy, completeness, comparability and NDCs can only be effective if contributions from the land sector are quantifiable and progress can be tracked unambiguously.

Decisions and options related to the inclusion of forest and land-use in an NDC

Defination of accounting approach	Activities based	Land based	Forest definition	Definition of activities and categories
Choice of methodological guidance	IPCC 1996	IPCC 2003 GPG for LULUCF	IPCC 2006	Other methodology
Cacaulation of reference level	Historic level	Linear extra-polation	Non-Linear extra-polation	Modelling

2.2 The IPCC Guidelines in ETF

The IPCC Guidelines provide approaches, methodologies and technical guidance for preparing a GHG inventory for the LULUCF sector. The fundamental basis for the inventory methodology rests upon two linked assumptions:

I. The flux of CO2 to/from the atmosphere is equal to changes in carbon stocks in the existing biomass and soils,

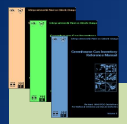
II. Changes in carbon stocks can be estimated by first establishing the rates of change in land use and the practice used to bring about the change (e.g. burning, clear-cutting, selective cutting, change in silviculture or management practice, etc.).

This requires the estimation of the forest and land use in the inventory year, conversion of forest or grasslands, and the stocks of carbon in the land-use categories (those that are subjected to change and those that are not).

2.3 Key IPCC principles for estimating E/R

The simplest methodological approach consists of combining information on the extent of human activity (called activity data - AD) with coefficients that quantify emissions/removals per unit activity (AF) .

Evolution of IPCC Guidance on forest and land-use



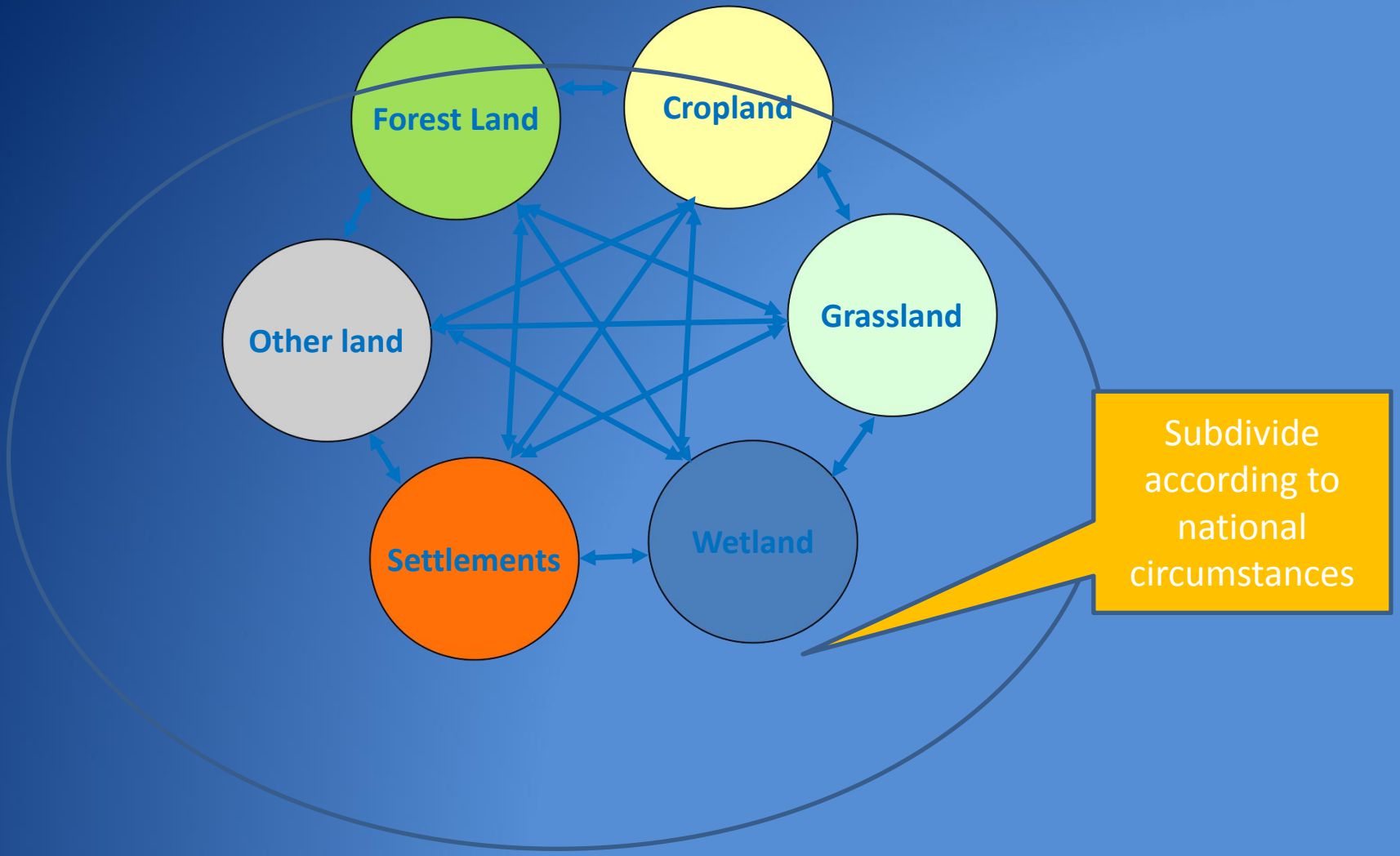
- ***1996 IPCC GLs***
- **Agriculture** and **Land Use and Change and Forestry** (LUCF) **separate** sectors
- Only the most important activities resulting in GHG emissions/removals
- Implicit assumption about estimating emissions and removals only over lands subject to human intervention
- Only accounted for above-ground biomass and soil C pools

- ***GPG & GPG-LULUCF***
- **Agriculture** and **Land Use, Land-use Change and Forestry** (LULUCF) **separate** sectors
- Provides ***good practice*** and uncertainty management guidance
- Now includes all land use emissions/ removals split into six land-use categories from all pools
- Explicit Use of ***managed*** land

- ***2006 IPCC Guidelines***
- **Agriculture** and **Land Use and Change and Forestry** (LUCF) combined into a **single sector Agriculture, Forestry and Other Land Use** (AFOLU)
- Same approach as GPG-LULUCF
- Retained use of ***managed*** land
- Inclusion and consolidation of several previously optional categories

2.3.1 land-use categories

Stock changes of C pools are estimated and reported for the six "**top-level**" land-use categories



2.3.2 Carbon Pools

Living biomass

Above ground biomass

- All living biomass above the soil incl. stem, stump, branches, bark, seeds & foliage

Below ground biomass

-All living biomass of live roots, often excl. fine roots of less than (suggested) 2 mm dia.

Dead Organic Matter

Dead wood

-All non-living woody biomass not litter either standing, lying on the ground, or in the soil;

-Incl. surface wood, dead roots, stumps larger than dia. used by country to distinguish from litter (e.g., 10 cm).

Litter

-All non living biomass of dia. < chosen by the country (e.g., 10 cm) lying dead above soil;

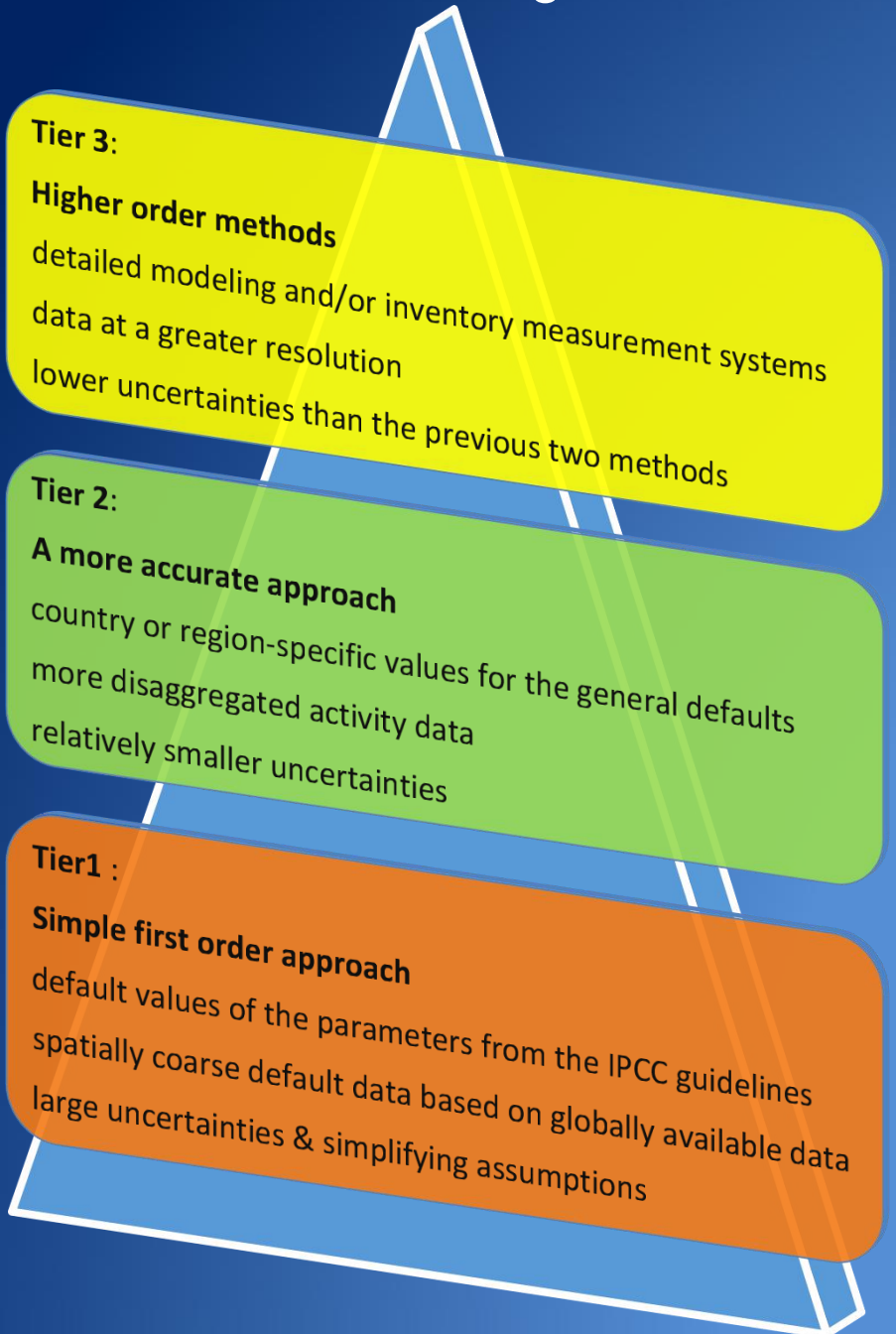
- Incl. litter, fumic and humic layers & live fine roots > dia. used to distinguish below ground biomass (e.g., 2 mm).

Soil C

organic C in mineral and organic soils (including peat) to a specified depth chosen by country (default depth 30 cm for Tier 1 & 2 methods)

incl. live fine roots if cannot be distinguished empirically

2.3.3 Three methodological Tiers



•Tier 3: Derived emission factors from models and inventory measurement systems. Very high resolution data, often obtained from a global information system (GIS) –based (or similar) source to acquire data from a fine grid.

Tier 2: Activity data defined by the country for the most important land uses/activities. This level requires higher resolution activity data to correspond to specific regions and land-use categories

Tier 1: The default emission factors provided in the IPCC Guidelines; Nationally or globally available estimates of deforestation rates, agricultural production statistics, and global land-cover maps

2.3.4 Cross Cutting issues- Uncertainty Assessment

- Broad sources of uncertainty are:
  - Uncertainty in land-use and management activity and environmental data (land area estimates, fraction of land area burnt etc.)
  - Uncertainty in the stock change/emission factors for Tier 1 or 2 approaches (carbon increase and loss, carbon stocks, and expansion factor terms)
  - Uncertainty in model structure/parameter error for Tier 3 model-based approaches, or measurement error/sampling variability associated with a measurement-based inventories
- Uncertainty can be reduced by: using higher tier methods; more representative parameter values; and AD at higher resolution.

2.3.5 QA/QC

- It is *good practice* to perform quality control checks through Quality Assurance (QA) and Quality Control (QC) procedures, and expert review of the emission estimation procedures.
- Tier 1 QC procedures are routine and consistent checks to: ensure data integrity, correctness and completeness; identify and address errors and omissions; and to document and archive inventory material and record all QC activities.
- It is a good practice to employ additional category-specific Tier 2 QC checks especially for higher tier methods.
- QA/QC procedures should be clearly documented for each land-use subcategory (e.g., FL-FL and L-FL etc.).

2.3.6 FOLU Key messages

- The IPCC identifies 5 carbon pools for each land use category, carbon stock changes and E/R are estimated for each of the carbon pools
- Use of Tier structure and land representation
- Select method of estimation (equations), based on tier level selected, quantify emissions/removals for each land-use category, carbon pool
- The total CO2 emissions/removals from C stock changes for each LU category is the sum of those from the two subcategories
- Cross-cutting issues

2.4 Forest and land use information under the biennial transparency report, national inventory document pursuant to the transparency framework

- Overview of sector (e.g. quantitative overview and description, including trends and methodological tiers by category, and coverage of pools) and background information
- Land-use definitions and the land representation approach(es) used and their correspondence to the land use, land-use change and forestry categories (e.g. land use and land-use change matrix)
- Country-specific approaches
  - ✓ Information on approaches used for representing land areas and on land-use databases used for the inventory preparation
  - ✓ Information on approaches used for natural disturbances, if applicable
  - ✓ Information on approaches used for reporting HWP

- Category (CRT category number)
  - ✓ Description (e.g. characteristics of category)
  - ✓ Methodological issues (e.g. choice of methods/activity data/emission factors and activity data and emission factors used, assumptions, parameters and conventions underlying the emission and removal estimates and the rationale for their selection, any specific methodological issues (e.g. description of national methods and models))

  - ✓ Uncertainties and time-series consistency Description of application of flexibility for those developing country Parties that need it in the light of their capacities, if applicable

  - ✓ Category-specific QA/QC and verification, if Category-specific recalculations, if applicable, including explanatory information and justifications for recalculations, changes made in response to the review process and impact on emission trend

- ✓ Category-specific planned improvements, if applicable (e.g. methodologies, activity data, emission factors), including those in response to the review process

3. MRV challenges in China

Quantitative evaluation of the NDCs is challenged by the lack of sufficient data and comprehensive information on the definitions, assumptions and methods applied by each country.

3.1 The progress MRV in China

National inventory report (NIR) and BUR in China

Report	NIR	Guideline	Forest and land use	Tie
the Initial National Communication	1994	IPCC 1996	FLOU	Tie2
The Second National Communication	2005	IPCC 1996 IPCC 2006(some)	FLOU	Tie2
The Third National Communication	2010	IPCC LULUCF best practices	LULUCF	Tie2
The first BUR	2012	IPCC LULUCF best practices	FLOU	Tie2
The second BUR	2014	IPCC 2006	LULUCF	Tie2

3.2 **MRV challenges** in China

According to Paris Agreement rules , from 2014, every party (flexibility for some developing countries) will submit :

- Biannual national report including annual NIR, using IPCC 2006
- Information to tract Implementation of NDC

Challenges in China

- Inventory and survey data of LULUCF every year for annual NIR
- Improve accuracy of NIR of LULUCF results,(now LULUCF -21.2%~21.2%)
- Inventory and survey of forest project using more concise modelling and Tir3 data, for estimation of carbon sink /emission in project level, for CCER in carbon market.

Thanks