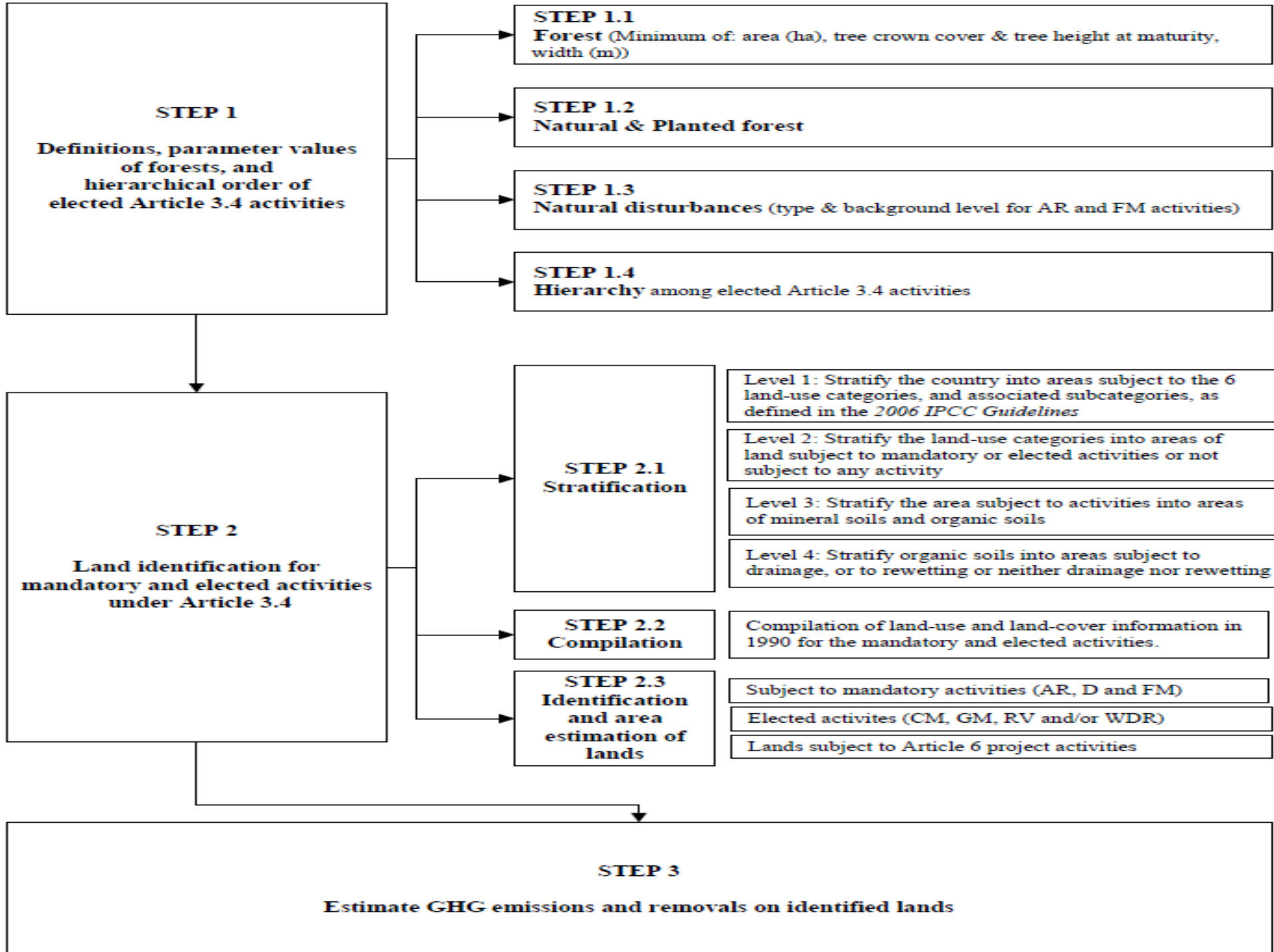


OVERVIEW OF STEPS TO ESTIMATING
AND REPORTING SUPPLEMENTARY
INFORMATION FOR ACTIVITIES
UNDER ARTICLES 3.3 AND 3.4

by Sandro Federici



- **STEP 1.1: Decide the numerical values of parameters to define “forest”** for AR and D activities under Article 3.3 and for FM under Article 3.4

Already done in the 1st CP

Please note that it is good practice to define also a minimum width; which is the parameter to be considered in case of linear clearing of forest cover:

- A linear clearing with width narrower than that selected for the forest definition is reported as FM;
- A linear clearing with width larger than that selected for the forest definition is reported as D (if the length is enough to achieve the minimum area of forest definition);
- In applying definition of forest during the first CP, some countries excluded certain types of land e.g. fruit orchards, grazed savannas, urban trees, and some types of plantations, even if these lands meet the thresholds for forest.
- In case of such exclusion, to achieve transparency, **it is good practice:**
 - To document the rationale of criteria used to exclude from forest those areas which meet the thresholds for forest (e.g., consistency with national forest inventories, with reporting to FAO), and how these criteria are applied consistently across the country and CPs;
 - To describe the consequences on accounting of this exclusion of emissions by reporting information about their magnitude and net balance

- **STEP 1.2: Define natural forest and planted forest.** It is good practice that Parties, according to their national circumstances:
 - (a) provide their definition of natural forest and planted forest (which include forest plantation as defined in the 2006 IPCC Guidelines);
 - (b) define when a conversion from natural forest to planted forest occurs;
 - (c) apply these definitions consistently throughout the CPs.

Why?

Conversion of natural forest in forest plantations determine a net loss of standing C stocks (similarly to deforestation)

with a consequent long term increase in the CO₂ concentration in the atmosphere,

which is expected not to be credited!

- STEP 1.3: If applicable, **define**, for AR and FM activities, **natural disturbances** in terms of type, and **calculate** for each activity the **background level** of emissions associated with disturbances **and** a **margin**, where a margin is needed.

How?

see **Zoltan** presentation!



- **STEP 1.4: Establish a hierarchy among** Article 3.3, FM and elected Article 3.4 **activities** to provide a framework for consistent attribution.

How?

- Article 3.3 activities and FM are mandatory and take precedence over elected 3.4 activities;
- Once land has been reported and accounted under the KP it cannot be excluded from reporting and accounting and the hierarchy needs to recognise this;
- Double counting needs to be avoided

Therefore a land has to be continuously reported under the activity where has been reported for the first time unless an activity with higher hierarchy is subsequently implemented on the land

- WDR is by definition the lowest level of the hierarchy
- It is good practice to apply the same hierarchy among elected activities under Article 3.4 across CPs

Therefore:

- D activities take precedence in the reporting hierarchy over AR activities.

Land that was **reported under D**, on which **subsequent regrowth of forests occurs** continues to be reported under Article 3.3 (D) and it **is good practice to report it as a subcategory** to indicate that this previously deforested land can be acting as a carbon sink.

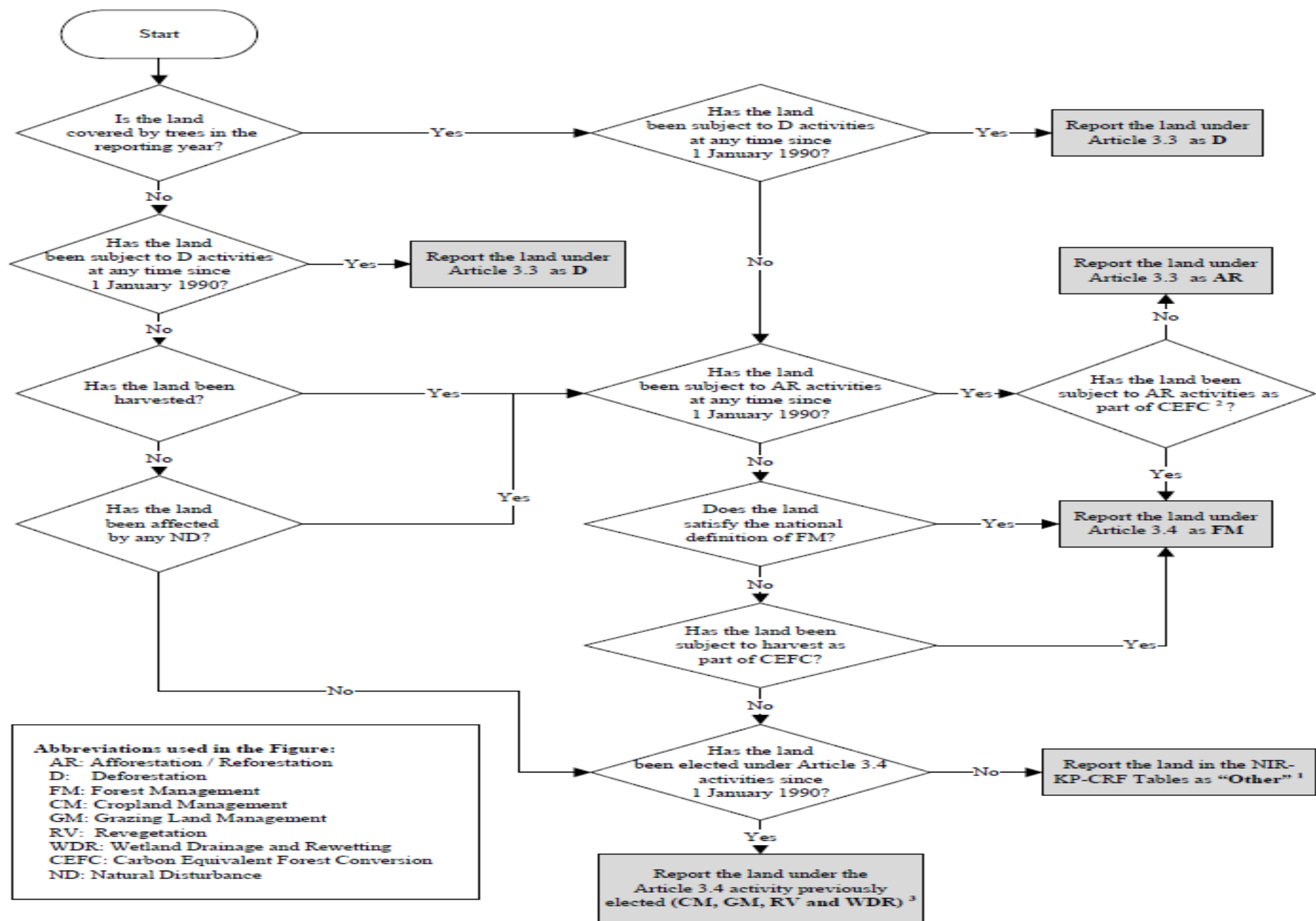
- AR and D activities take precedence over FM activities.
- AR, D and FM activities take precedence in the reporting hierarchy over any other elected Article 3.4 activity.
- Parties establish the reporting hierarchy among elected activities of CM, GM and RV.
- Since WDR is limited to lands that are not accounted for under any other activity, lands not already reported under any of the above activities in a given year, on which drainage and rewetting of organic soils take place are reported under WDR, if elected by the Party

In addition:

- Land subject to direct human-induced conversion from forest plantation to non-forest is reported under D (Article 3.3) unless a Party chooses to use the provision for CEFC and all requirements are met, in which case it is reported under FM;
- Land subject to direct human-induced conversion from non-forest to forest is reported under AR (Article 3.3) unless this land is used to compensate the harvest of forest plantations and conversion to non-forest land under the provisions for CEFC and all requirements are met, in which case it is reported under FM;
- Agricultural land use may rotate between Cropland and Grassland associated with grazing.
 - Where a Party has elected both Article 3.4 CM and GM activities, to reduce reporting complexity and to avoid artefacts or inaccuracies in CM and GM reporting, it may report all land subject to CM and GM under a single activity, normally CM.
 - Where a Party has elected only one activity, either CM or GM, it is good practice to report and account the entire land subject to rotation under the elected activity.

Figure 1.2

Decision tree for classifying land in the reporting year under Article 3.3 (AR, D), FM, any elected Article 3.4 activity (CM, GM, RV and WDR), or not at all (“Other”). Secondary classifications are not shown in the figure.



Note that:

- The decision tree is to be applied annually during the CP in order to update the allocation of lands to activities, thus taking into account shifts in land use that may have occurred.
- This may be achieved by annual tracking of land or by interpolation between consecutive assessments of land use.
- For land that is subject to an Article 3.4 activity, it is necessary to know whether it was subject to any other mandatory or elected activity in the previous year:
 - If the land was subject to a mandatory activity it should be kept under that activity,
 - otherwise it is *good practice* to assign it to the elected activity that is higher in the hierarchical order of elected Article 3.4 activities.
- Similarly, if land is subject to more than one Article 3.4 activity, it is *good practice* to assign it to the elected activity that is higher in the hierarchical order.

Note that:

- Once land is accounted for and therefore reported under an Article 3.3, FM or elected Article 3.4 activity, all anthropogenic GHG emissions from sources and removals by sinks on this land must be reported from that time forward through the second CP.
- Therefore, the total land area included in the reporting of Article 3.3 and 3.4 activities can never decrease.
- For CM and GM, the guidance provided in the GPG-LULUCF acknowledges that some of the area of the activity in the ‘base year only’ may no longer be reported under that activity in the reporting year.
- Where this area is not transferred to another reported activity the associated emissions and removals will be accounted as zero in that year. In order to achieve transparency in reporting, it is good practice to describe the consequences of this exclusion on reported emissions and removals

Be aware that:

- Once in a land a carbon removal (i.e. a carbon stock increase) has been accounted for such a carbon stock must be tracked over time to ensure its permanence and any reversal must be accounted for at time when it occurs
- Therefore, in a land where C stock net gains have been accounted for, subsequent C stock net losses associated with management cannot be excluded from accounting, e.g. by zeroing them.
- When a net C stock loss is occurring in an area of CM and GM, for which in previous years a net C stock gain has been accounted for, and the Party is otherwise accounting for zero emissions and removals, because the area is not more subject to any CM/GM activity, the consequence is a failure in ensuring permanence in accounting and therefore such zeroing should not be allowed

Further:

- Land subject to activities under Article 3.3 which would otherwise be subject to FM or an elected activity under Article 3.4 are to be identified as lands that are both subject to Article 3.3 and 3.4 activities by using secondary classifications (these are not shown in the decision tree in Figure 1.2).
- The decision tree implies that AR, D and FM have precedence over the other activities for land classification and reporting.
- Land classified as forests at any time since 31 December 1989, including AR land and subsequently deforested is reclassified as D land.
- Land cannot be transferred from an elected to an unelected Article 3.4 activity
- Land cannot leave the Article 3.3 reporting
- It is good practice to define the boundaries between FM and CM or GM, where these are applied on the same area, using the national forest definition applied consistently with past reporting practice

- **STEP 2.1: Stratify the country** into areas of land for which the geographic boundaries will be reported, as well as the areas of land subject to Article 3.3 and the areas of land subject to Article 3.4 within these geographic boundaries. This step can be omitted if Reporting Method 2 is used.
- **Stratification of the country should occur at the following four levels:**
- Level 1: stratify the country into areas subject to the six land-use categories, and associated subcategories, as defined in the *2006 IPCC Guidelines*;
- Level 2: stratify the land-use categories into areas of land subject to mandatory or elected activities or not subject to any mandatory or elected activity;
- Level 3: stratify the area subject to activities into areas of mineral soils and organic soils;
- Level 4: where such activities do occur, stratify areas with organic soils into areas subject to drainage or rewetting or neither drained nor rewetted.

Scenario: A cropland was converted into grazing land in 2010. FM, CM and GM were elected in CP1.							
Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	E	E	E	N/E	N/A
Status in CP2	M	M	M	M	M	N/E	N/E
Reporting solution				Report under CM for 2008 and 2009 only	Report under GM for all years from 2010 to 2020		
Comments	<p>The example assumes that GM is higher than CM in the hierarchy. It is mandatory to continue to account for GM also into CP2</p> <p>M-Mandatory reporting obligation; E- Elected activity; N/E- Not Elected; N/A- Not Applicable in this reporting period.</p>						

In case of a rotation system the land can be continuously reported under CM

Scenario: A cropland is converted into a grazing land in 2015, CM, GM and RV were elected in CP2.							
Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	N/E	N/E	N/E	N/E	N/A
Status in CP2	M	M	M	E	E	E	N/E
Reporting solution				Report under CM for 2013 and 2014 only	Report under GM for all years from 2015 to 2020	OR Report under RV for all years from 2015 to 2020	
Comments	Two reporting scenarios are possible. The converted land can be classified as GM or RV according to their level in the hierarchy established by the country. The reporting is based on the definitions for classifying lands under the activities. When communicating the decision to elect the KP activity for CP2, the country is required to provide the definitions of activities which will be classified under each KP activity and the hierarchy of elected activities which it will apply. Accounting will not be affected by which option is chosen.						

Hierarchical order among Article 3.4 activities

Scenario: A cropland was converted into a grazing land in 2015, CM was elected in CP2. GM was not elected.

Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	N/E	N/E	N/E	N/E	N/A
Status in CP2	M	M	M	E	N/E	N/E	N/E
Reporting solution				Report under CM for all years from 2013 to 2020 including period following conversion to grazing land.			
Comments	Continue to report area converted to grazing land under CM. Once land has been reported under any Article 3.3 or 3.4 activity during a CP, it must continue to be reported. As noted in Section 1.3, emissions and removals may, in this example, be accounted as zero from 2015 to 2020. In order to achieve transparency in reporting, it is <i>good practice</i> to describe the consequences of the zero accounting on reported emissions and removals.						

In case of a rotation system the zeroing would not be justified

Scenario: A cropland was converted into a Settlement in 2015, CM was elected in CP2							
Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	N/E	N/E	N/E	N/E	N/A
Status in CP2	M	M	M	E	N/E	N/E	N/E
Reporting solution				As in Example 6, report this land as CM from 2013 to 2020			
Comments	Continue to report area converted to Settlement under CM. Once land has been reported under any Article 3.3 or 3.4 activity during a CP, it must continue to be reported. As noted in Section 1.3, emissions and removals may, in this example, be accounted as zero from 2015 to 2020. In order to achieve transparency in reporting, it is <i>good practice</i> to describe the consequences of the zero accounting on reported emissions and removals						

Where zeroing implies not permanence of accounted removals is not to be allowed

CM/GM zeroing:

When a land is included in the CM/GM base year only, no net removals (i.e. net C gain) from that land are accounted for as carbon credits and therefore permanence is not an issue. E.g.:

- an area that contained a young orchards in 1990 has been cleared in 2000 and converted to settlements.
- In the 2nd CP CM has been elected.
- The net removals estimated in 1990 on that land has never been credited, consequently zeroing emissions and removals during the CP does not result in missing to account for a reversal of a previously accounted net C stock gain.



CM/GM zeroing:

When a land has been accounted under CM/GM and is subsequently no more subject to the activity, the following cases may occur when considering permanence of accounted net CO₂ removals:

C stocks balance when subject to the activity	C stocks balance when no more subject to the activity	Is zeroing to be allowed?
<p>A net CO₂ removal in the land was accounted under CM/GM in previous years (i.e. the sum of net C stock changes accounted on the land, since the start of its accounting, is a net C gain)</p>	<p>Under the new use the land is a net C sink (i.e. a net C stock gain is estimated)</p>	<p style="text-align: center;">Yes,</p> <p>But not convenient in the cases in which a net C source or a smaller net C sink have been estimated for the base year</p>
	<p>Under the new use the land is a net C source (i.e. a net C stock loss is estimated)</p>	<p style="text-align: center;">No,</p> <p>To ensure permanence, the reversal of previously accounted net CO₂ removals must be accounted</p>
<p>A net CO₂ emission in the land was accounted under CM/GM in previous years (i.e. the sum of net C stock changes accounted on the land, since the start of its accounting, is a net C loss)</p>	<p>Under the new use the land is a net C sink (i.e. a net C stock gain is estimated)</p>	<p style="text-align: center;">Yes,</p> <p>But not convenient in the cases in which a net C source or a smaller net C sink have been estimated for the base year</p>
	<p>Under the new use the land is a net C source (i.e. a net C stock loss is estimated)</p>	<p style="text-align: center;">Yes, in case the net C source is smaller than that included in the base year</p> <p style="text-align: center;">No, in case the net C source is larger than that included in the base year (occurred debits would otherwise be not accounted)</p>

CM/GM zeroing:

When a land has been accounted under CM/GM and is subsequently no more subject to the activity, the following cases may occur when considering non-CO₂ emissions:

- A. non-CO₂ emissions are larger under the new land use than they were under CM/GM  Zeroing would result in avoiding to account for increasing emissions. To be allowed?
- B. non-CO₂ emissions are smaller under the new land use than they were under CM/GM  Zeroing would result in avoiding to account for achieved mitigation To be allowed?

In any case when zeroing is applied, GHG emissions and CO₂ removals in both the base year and the CP year needs to be zeroed, where only GHG emissions and CO₂ removals in the CP year are zeroed undue credits will be accounted in the case the land was in the base year a net source of GHG emissions

Scenario: An area of cropland on drained organic soil is rewetted to restore wetland ecosystem function in 2015. CM and WDR are elected for CP2							
Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	N/E	N/E	N/E	N/E	N/A
Status in CP2	M	M	M	E	N/E	N/E	E
Reporting solution				Report as CM from 2013 to 2020			
Comments	Continued reporting of this area under CM because it takes precedence over WDR, which is at the lowest level on the hierarchy. This assumes the final status of the land is not included under the national definition of any Article 3.3, or FM activity.						

No zeroing needed here, the land has been transferred to another activity

Scenario: From 2013 to 2020, under the influence of natural forces, an area of FM becomes water saturated and the forest dies back. WDR has been elected for CP2							
Activity	D	AR	FM	CM	GM	RV	WDR
Status in CP1	M	M	E	N/E	N/E	N/E	N/A
Status in CP2	M	M	M	N/E	N/E	N/E	E
Reporting solution			Continue to report emissions and removals under FM				
Comments	The forest cover loss is not directly human-induced so the land is not subject to D. Further, FM is higher in the reporting hierarchy than the elected activities. Although WDR has been elected, the land must continue to be reported under FM.						

Although methodologies reported in the 2013 IPCC Supplement on Wetlands need to be applied for estimating GHG emissions and CO₂ removals

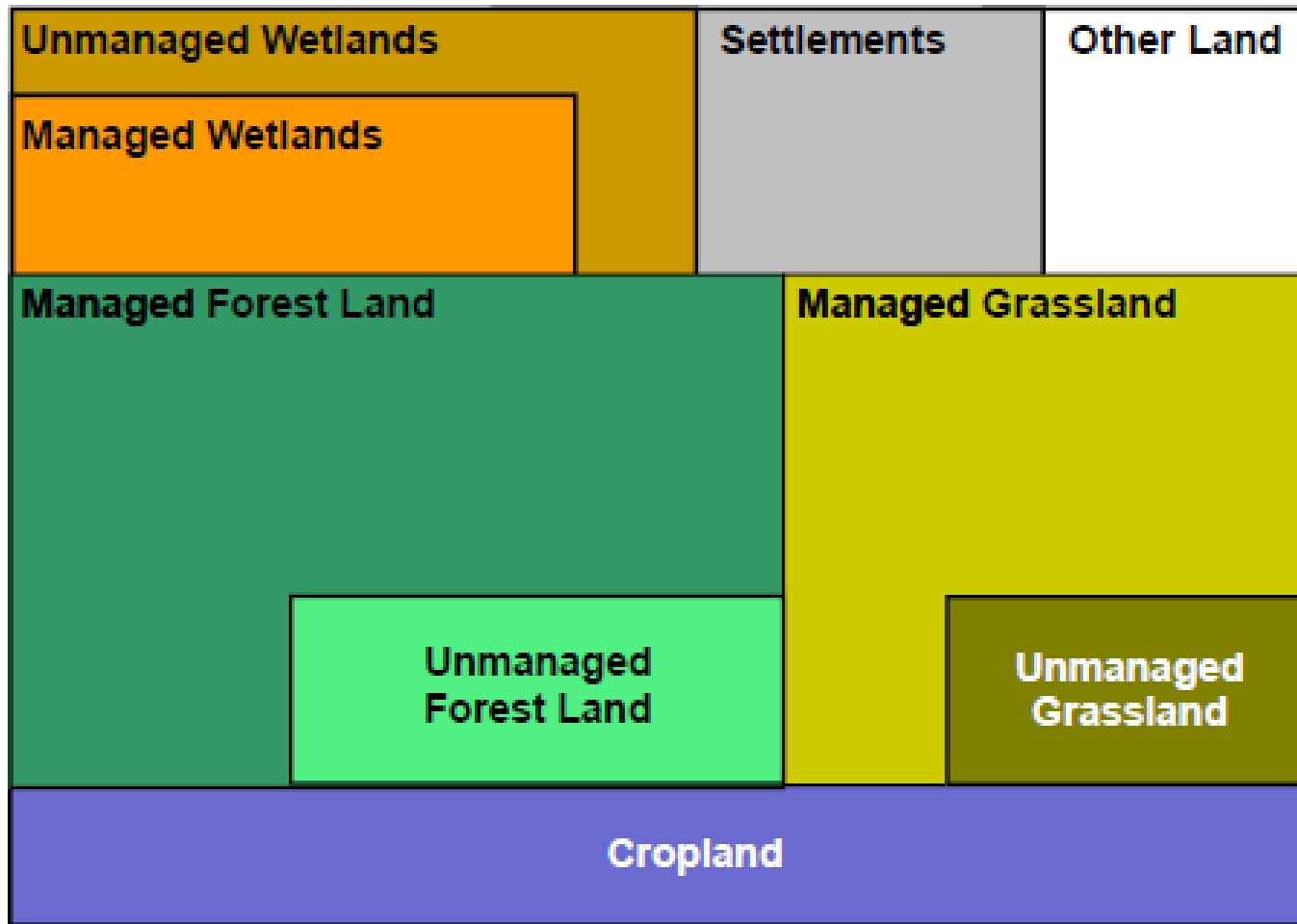
Be aware:

- 2006 IPCC Guidelines provides default emissions factors stratified by:

TABLE 3.1 EXAMPLE STRATIFICATIONS WITH SUPPORTING DATA FOR TIER 1 EMISSIONS ESTIMATION METHODS	
Factor	Strata
CLIMATE (see Annex 3A.5)	Boreal Cold temperate dry Cold temperate wet Warm temperate dry Warm temperate moist Tropical dry Tropical moist Tropical wet
SOIL (see Annex 3A.5)	High activity clay Low activity clay Sandy Spodic Volcanic Wetland Organic
BIOMASS (ECOLOGICAL ZONE) (see Figure 4.1, in Chapter 4 Forest Land)	Tropical rainforest Tropical moist deciduous forest Tropical dry forest Tropical shrubland Tropical desert Tropical mountain systems Subtropical humid forest Subtropical dry forest Subtropical steppe Subtropical desert Subtropical mountain systems Temperate oceanic forest Temperate continental forest Temperate steppe Temperate desert Temperate mountain systems Boreal coniferous forest Boreal tundra woodland Boreal mountain systems Polar
MANAGEMENT PRACTICES (more than one may be applied to any land area)	Intensive tillage/Reduced till/No-till Long term cultivated Perennial tree crop Lining High/Low/Medium Input Cropping Systems Improved Grassland Unimproved Grassland

- STEP 2.2: Initial conditions: **Compile initial land-use and land-cover information for 31 December 1989.**
- Using the selected definitions of forest determine forest and non-forest areas on 31 December 1989.
- This can be accomplished with a map that identifies all areas considered forest, or with statistical data derived from a national land survey as time-series of a national forest inventory.
- All forest-related land-use change activities since 1 January 1990 can then be determined with reference to either maps or statistical sets of data
- Many countries identify deforestation / afforestation / reforestation because of administrative data on grant schemes for forest plantation and licence to convert forest to other uses.

Land use categories in the national inventories under the UNFCCC



GHG emissions and CO₂ removals need not to be reported for unmanaged lands.

RELATIONSHIP BETWEEN UNFCCC LAND-USE CATEGORIES AND ACTIVITIES UNDER THE KP

Final Initial	Managed Forest Land	Cropland	Grassland	Wetlands	Settlements	Other Land
Unmanaged Forest Land**	FM	D**	D**	D	D	D
Managed Forest Land	FM, AR ^a	D**	D**	D	D	D
Cropland	AR ⁺	CM, RV, WDR***	CM [#] , GM, RV, WDR***	CM, RV, WDR***	CM****, RV	CM****
Grassland	AR ⁺ , FM	CM, GM ^{##} , RV, WDR***	GM, RV, WDR***	GM, WDR***	GM****	GM****
Wetlands	AR ⁺ , FM	CM, RV, WDR***	GM, RV, WDR***	RV, WDR***	RV, WDR***	WDR***
Settlements	AR ⁺	CM, RV, WDR***	GM, RV, WDR***	RV, WDR***	RV	
Other Land	AR ⁺ , FM	CM, RV	GM, RV	RV, WDR***	RV	

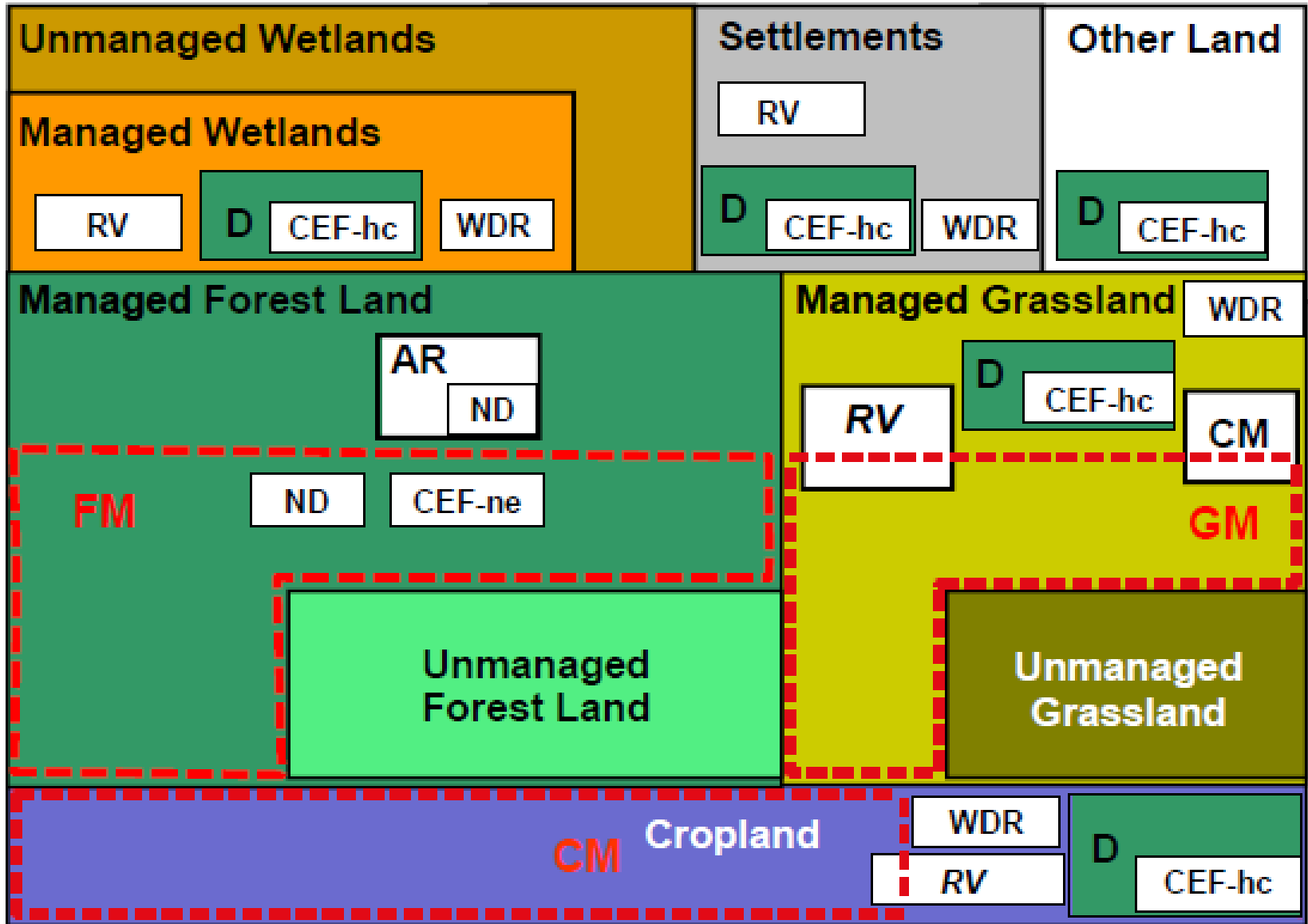
Notes

AR: Afforestation / Reforestation, D: Deforestation, FM: Forest Management, CM: Cropland Management, GM: Grazing Land Management, RV: Revegetation, WDR: Wetland Drainage and Rewetting.

- a Twenty years after afforestation or reforestation land transitions from land converted to forest land to forest land remaining forest land but under KP this land continues to be reported as AR.
- * If the conversion is direct human-induced then classify as AR which takes precedence over FM and therefore although the land is subject to FM, it is reported under AR. If the conversion is not direct human-induced, and the definition of FM is met, then the land is reported in FM.
- ** D takes precedence over cropland/grassland categories.
- *** When elected, WDR only applies on land which is not accounted for under any Article 3.3, FM or other elected Article 3.4 activity
- **** Once land has been reported under any Article 3.3 or 3.4 activity during a CP, it must continue to be reported.
- # Only if CM is elected and GM is not elected.
- ## Only if GM is elected and CM is not elected.

Land in KP reporting for a hypothetical country in year X of the CP.

This classification corresponds to the “final” status in previous table



Once under any KP activity, a land is to be considered managed continuously across time.

Reporting Methods for lands subject to Article 3.3 and Article 3.4 activities

- Decisions 2/CMP.7 and 2/CMP.8 state that those areas of land subject to Article 3.3 and 3.4 activities must be:
 - Identifiable
 - adequately reported
 - tracked over time.
- **Reporting Method 1** uses a spatially-referenced approach that delineates the geographic boundaries that contain multiple land units subject to Article 3.3 or 3.4 activities.

The geographic boundaries can be defined using georeferenced legal, administrative, or ecosystem boundaries, although the location of each land unit within these geographic areas may not be known.

When using Reporting Method 1 it is usually good practice to use the same geographical boundaries for all activities. This will greatly facilitate the identification, quantification, and reporting of land-use changes.

- **Reporting Method 2** is based on the spatially-explicit and complete geographical identification of all land units subject to Article 3.3 and Article 3.4 activities.

Reporting Methods for lands subject to Article 3.3 and Article 3.4 activities

- For both reporting methods information additional to land cover and land use should be collected and tracked if ND and CEFC provisions are applied:
 - Area affected by ND:
 - any following change in land cover caused by salvage logging (to be sure that the associated emissions are not included in the ND's accounting)
 - Any subsequent change in land use (to be sure that any emissions from this kind of areas are not included in the ND's accounting)
 - Area reported as CEFC:
 - whether the area planted is, at least, large as that cleared
 - whether the area planted will achieve a carbon stock, at least, large as that cleared

Note that some areas may be CEFC subject to ND

- **STEP 2.3.1: Identify lands that are subject to mandatory activities (AR, D and FM):**
- Identify lands that, since 1 January 1990, are subject to activities that are mandatory for reporting (AR, D and FM), and estimate the total area of these lands within each geographic boundary.
- A country could interpret the definition of forest management in terms of specified forest management practices undertaken since 1990, such as fire suppression, harvesting or thinning (narrow approach).
- Alternatively, a country could interpret the definition of forest management in terms of a broad classification of land subject to a system of forest management practices, without the requirement that a specified forest management practice has occurred on each land (broad approach)

- it is good practice to report, for each year in the CP:
 - the area of lands with natural forests that have been converted to planted forests and to report the associated emissions under FM.
 - Countries which have selected to use the provisions of natural disturbance the area of those lands affected by natural disturbances;
 - Countries which chose to use the provision of CEFC, the area of those lands of forest plantation which have been harvested and converted to non-forest land as well as the area of those lands that have been converted to forest to compensate for conversion of forest plantation.

Afforestation/Reforestation

land identification and tracking

GEOGRAPHIC LOCATION ¹²¹	ACTIVITY DATA			
Identification code	Subdivision ¹³¹	Area subject to the activity	Area of mineral soils	Area of organic soils ¹⁴¹
		(kha)		
Total for activity A.1 ¹⁴¹				
Subtotal				
Land subject to natural disturbances ¹⁴²¹				
Subtotal				

Identification code of geographic location ²⁾	IDENTIFICATION OF NATURAL DISTURBANCES EVENT		AREA SUBJECT TO NATURAL DISTURBANCES IN THE YEAR WHEN IT WAS FIRST REPORTED	
	Year of natural disturbances ³⁾	Disturbance type	Area subject to natural disturbances in the year when it was first reported	Area subject to natural disturbances in the inventory year
			(kha)	
Total for inventory year				
Total for 2013 natural disturbances ¹¹⁾				
Total for 2014 natural disturbances ¹¹⁾				
Total for 2015 natural disturbances ¹¹⁾				
Total for 2016 natural disturbances ¹¹⁾				
Total for 2017 natural disturbances ¹¹⁾				
Total for 2018 natural disturbances ¹¹⁾				
Total for 2019 natural disturbances ¹¹⁾				
Total for 2020 natural disturbances ¹¹⁾				

Deforestation

land identification and tracking

GEOGRAPHIC LOCATION ⁽³⁾	ACTIVITY DATA			
Identification code	Subdivision ⁽⁴⁾	Area subject to the activity	Area of mineral soils	Area of organic soils
		(kha)		
Total for activity A.2⁽¹¹⁾				
Subtotal				
Deforested land previously reported under afforestation/reforestation and forest management and subject to natural disturbances^{(12), (13)}				
Subtotal				

Information items				
Land areas under deforestation by land-use category in the reporting year ⁽²⁾				
Total for activity (kha)				
Forest land				
Cropland				
Grassland				
Wetlands				
Settlements				
Other land				

Land otherwise subject to forest management or elected activities under Article 3.4

ACTIVITY DATA	
Subdivision by Activity ⁽¹⁾	Area subject to the activity (kha)

Forest Management

land identification and tracking

GEOGRAPHIC LOCATION ⁽²⁾	ACTIVITY DATA				
Identification code	Subdivision	Year ⁽³⁾	Area subject to the activity	Area of mineral soils	Area of organic soils
			(kha)		
Total for activity B.1⁽¹⁰⁾					
Subtotal					
Newly established forest(CEF-ne)⁽¹¹⁾					
Subtotal					
Harvested and converted forest plantations (CEF-hc)					
Subtotal					
Land subject to natural disturbances ⁽¹²⁾					
Subtotal					

Identification code of geographic location ⁽²⁾	IDENTIFICATION OF NATURAL DISTURBANCES EVENT		AREA SUBJECT TO NATURAL DISTURBANCES IN THE YEAR WHEN IT WAS FIRST REPORTED	
	Year of natural disturbances ⁽³⁾	Disturbance type	Area subject to natural disturbances in the year when it was first reported	Area subject to natural disturbances in the inventory year
			(kha)	
Total for inventory year				
Total for 2013 natural disturbances⁽¹¹⁾				
Total for 2014 natural disturbances⁽¹¹⁾				
Total for 2015 natural disturbances⁽¹¹⁾				
Total for 2016 natural disturbances⁽¹¹⁾				
Total for 2017 natural disturbances⁽¹¹⁾				
Total for 2018 natural disturbances⁽¹¹⁾				
Total for 2019 natural disturbances⁽¹¹⁾				
Total for 2020 natural disturbances⁽¹¹⁾				

Additional information: area of natural forests converted to planted forests

ACTIVITY DATA		
Subdivision ⁽¹⁾	Total area subject to conversion	Area of organic soils ⁽²⁾
	(kha)	

Organic soils

land identification and tracking

Identification code of geographical location ⁽⁴⁾	ACTIVITY DATA
	Area (kha)
A.1. Afforestation and reforestation	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.2. Deforestation	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.1. Forest management	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.2. Cropland management (if elected)	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.3. Grazing land management (if	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.4. Revegetation (if elected)	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	
B.5. Wetland drainage and rewetting (if elected)⁽⁷⁾	
Total for organic soils	
Drained organic soils	
Rewetted organic soils	

Mineral soils

land identification and tracking

N₂O emissions from N mineralization/immobilization due to carbon loss/gain associated with land-use conversions and management change in mineral soils⁽¹⁾

Identification code of geographical location ⁽²⁾	ACTIVITY DATA	
	Land area ⁽³⁾ (kha)	Carbon stock changes (kt C)
A.1. Afforestation/reforestation		
Total mineral soils		
A.2. Deforestation^{(5), (6)}		
Total mineral soils		
B.1. Forest management		
Total mineral soils		
B.2. Cropland management		
Total mineral soils		
B.3. Grazing land management		
Total mineral soils		
B.4. Revegetation		
Total mineral soils		

Fires

land identification and tracking

Greenhouse gas emissions from biomass burning			
Identification code of geographic location ⁽¹⁾	ACTIVITY DATA		
	Description ⁽²⁾	Unit	Values
	Area- or fuel	ha or kg dm	
A.1. Afforestation/reforestation ⁽⁶⁾			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
A.2. Deforestation ⁽⁶⁾			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
B.1. Forest management ⁽⁶⁾			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
B.2. Cropland management (if elected) ^{(6), (7)}			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
B.3. Grazing land management (if elected) ^{(6), (8)}			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
B.4. Revegetation (if elected) ⁽⁶⁾			
Total for controlled burning			
Total for wildfires			
Controlled burning	(specify)	(specify)	
Wildfires	(specify)	(specify)	
B.5. Wetland drainage and rewetting (if elected) ⁽⁶⁾			
Total for controlled burning			

- **STEP 2.3.2: Identify lands that are subject to elected activities (CM, GM, RV and WDR):**
- For CM or GM identify the land area subject to the activity in each inventory year of the CP, as well as in 1990 (or equivalent year, as base year area)
- For RV identify the land area subject to the activity in each inventory year of the CP since 1990, as well as in 1990 (as base year area)
- For WDR identify the land area subject to the activity in each inventory year of the CP since 1990 (same area applies also for base year)

SOURCES OF DATA FOR IDENTIFYING LANDS

- In very general terms there are three major options and their combinations that can be taken to meet the information needs:
 - To use information from existing national statistics and land-use and forest inventory systems. [national statistics]
 - To implement a monitoring and measurement system to obtain information on land-use conversions, forest management, natural disturbances and other relevant activity data. [national forest monitoring system NFMS]
 - To implement a system by which land management activities are reported to government agencies, e.g. an incentive grant scheme for AR activities. To ensure integrity, such a reporting system should include verification and auditing procedures. [activity reporting]

- **STEP 2.3.3: Identify lands that are subject to Article 6 project activities:**
- Some lands subject to Article 3.3 or Article 3.4 activities can also be subject to projects under Article 6 of the KP.
- These have to be reported under Article 3.3 or Article 3.4.
- In addition, these lands need to be delineated and the GHG emissions and removals reported separately as part of project reporting
- When estimating the GHG emissions and removals of KP-LULUCF activities, it is possible to:
 - Option 1: Carry out Article 3.3 and Article 3.4 assessment without consideration of information reported for Article 6 projects
 - Option 2: Consider all changes of carbon stocks as well as other GHG emissions at the project level as a primary data source for Article 3.3 and/or Article 3.4 estimation and reporting (not vice versa)

(when using project-level information for reporting KP-LULUCF activities countries must take into account the projects' total contribution and not just the change relative to the projects' baseline scenario.)

- **STEP 3.1: Estimate GHG emissions and removals for each year of the CP, on all areas subject to the mandatory and elected activities:**
- Estimate GHG emissions and removals for each year of the CP, on all areas subject to the mandatory and elected activities (as identified in steps 2.3.1 and 2.3.2) while ensuring that there are no gaps and no double counting.
- The estimation of GHG emissions and removals for an activity begins with the onset of the activity or the beginning of the CP, whichever comes later.
- C stock changes from a pool can be excluded from accounting if the pool is not a source. With the exception of HWP and consequently of Aboveground biomass (indeed if aboveground biomass is not accounted an increase in HWP C stock would result in crediting even if the aboveground biomass C stock has been permanently decreased)
- When two or more pools are combined in the reporting, then it is good practice to demonstrate that the aggregated pool is not a source
- It is good practice to report, wherever it is applicable, levels of confidence in estimates that led to the exclusion of a pool

Good practice in providing verifiable information, which demonstrates that excluded pools, if any, are not a net source of GHGs, can be achieved by one or more of the four approaches listed below:

- Representative and verifiable sampling and analysis to show that the pool has not decreased. It is *good practice* under this approach to measure the pool at a sufficient number of sites, within regions, to provide statistical confidence, and to document the sampling and research methods; (*why then excluding it?*)
- Reasoning based on sound knowledge of likely system responses. For instance, if annual cropland is converted to forest land by AR, the dead wood pool cannot decrease, because there is no deadwood in that cropland;
- Surveys of peer-reviewed literature suitable for the activity, ecosystem type, region and pool in question (for example, showing that in the climatic situation and with the soil types of the region, AR of cropland leads to increases in soil organic carbon stocks);
- Combined methods.

Correct implementation of C stock change estimation methods when areas are changing

EXAMPLE

During a year of the CP the area of land reported under FM varies because new forest land (natural forest expansion or previously unmanaged forest land that becomes subject to management) is added to the FM area and because of deforestation activities:

	At the start of year	At the end of year
Area of forest lands that was subject to FM in the previous year	1,000,000 ha	990,000 ha
Area of lands subject to FM converted to non-forest land	0 ha	10,000 ha
Area of new forest lands subject to FM	0 ha	10,000 ha
Total area subject to FM	1,000,000 ha	1,000,000 ha

Correct implementation of C stock change estimation methods when areas are changing

The carbon stocks measured at times t_1 and t_2 in those lands are:

	At the start of year	At the end of year
Average per hectare biomass carbon stock of forest lands subject to FM	100 tC ha ⁻¹	105 tC ha ⁻¹
Average per hectare biomass carbon stock of new forest lands subject to FM	80 tC ha ⁻¹	84 tC ha ⁻¹
Average per hectare biomass carbon stock in deforested lands	100 tC ha ⁻¹	20 tC ha ⁻¹

A correct procedure will calculate stock changes in the three land categories:

- managed forest lands that were subject to FM since the beginning of the year,
- forest lands where the FM activity started during the year,
- managed forest lands subject to FM that were deforested and converted to cropland in the year.

Correct implementation of C stock change estimation methods when areas are changing

Then, the sum of stock changes calculated for the two types of lands subject to FM will be reported under the FM activity, while the change in stock calculated for deforested land will be reported under D (Article 3.3).

A. Total stock-change in area subject to FM that was subject to FM in the previous year	$990,000 \text{ ha} * (105 - 100) \text{ tC ha}^{-1} = 4,950,000 \text{ tC}$
B. Total stock-change in area subject to FM for the first time in this year	$10,000 \text{ ha} * (84 - 80) \text{ tC ha}^{-1} = 40,000 \text{ tC}$
C. Total stock-change in deforested areas	$10,000 \text{ ha} * (20 - 100) \text{ tC ha}^{-1} = -800,000 \text{ tC}$
Total stock-change in FM areas (A+B)	$4,950,000 + 40,000 = 4,990,000 \text{ tC}$
Stock change reported in Forest Land converted to Cropland under UNFCCC and in D under Article 3.3 (C)	$-800,000 \text{ t C}$

Correct implementation of C stock change estimation methods when areas are changing

It would be incorrect, for instance, to calculate the total aboveground biomass carbon stock on the total land subject to FM at times t_1 and t_2 and then subtract C_1 from C_2 e.g.:

C_1 Total stock in land subject to FM at the start of year	$1,000,000 \text{ ha} * 100 \text{ tC ha}^{-1} = 100,000,000 \text{ tC}$
C_2 Total stock in land subject to FM at the end of year	$990,000 \text{ ha} * 105 \text{ tC ha}^{-1} + 10,000 \text{ ha} * 84 \text{ tC ha}^{-1}$ $= 103,950,000 + 840,000 = 104,790,000 \text{ tC}$
$C_2 - C_1$ – yields the incorrect result	$104,790,000 - 100,000,000 = 4,790,000 \text{ tC}$

In summary, the area and associated carbon stock changes and non-CO₂ emissions to be reported by Parties, each year, under each activity are:

- For AR, D, FM, RV and WDR (FM only, when a “narrow” approach to the implementation of the definition is applied), the area to be reported under the activity is the cumulative area of lands subject, for the first time, to the activity since 1990, minus the area converted to other elected or mandatory activities according to the hierarchy among activities.

Although for each land carbon stock changes and non-CO₂ emissions have to be reported only since the year of the onset of the activity or the start of the CP, whichever comes later.

- For CM and GM, the area to be reported under the activity is the area that is subject to the activity since the start of the CP in which the activity has been elected, minus the area converted to other activities according to the hierarchy among activities.

Although for each land carbon stock changes and non-CO₂ emissions have to be reported only since the year of the onset of the activity or the start of the CP, whichever comes later.

- FM, when a “broad” approach to the implementation of the definition is applied, the area to be reported under the activity is the area that is subject to the activity in the year 1990 plus the cumulative area of lands subject to the activity after 1990, minus the area converted to other activities according with the hierarchy among activities.

Although for each land carbon stock changes and non-CO₂ emissions have to be reported only since the year of the onset of the activity or the start of the CP, whichever comes later.

Interannual Variability in GHG estimates

Interannual Variability is determined by 3 factors:

- Natural disturbances

(when accounting: FMRL and ND provisions factor out their contribution);

- Climate and other non-direct-human-induced factors

(IPCC default methods and factors are insensitive to variability of these factors, while Tier 3 methods are sensitive);

- Human activities

(this is the goal when accounting for mitigation);

It is good practice:

- to document whether the method used (for FMRL, or BY, and for CP's estimates) is sensitive to climate and environmental variability
- to use the same climate and environmental data for FMRL/BY and for CP's estimates, when a Tier 3 method responsive to climate and environmental variability is used
- to report how interannual variation was addressed in the inventory calculations

Factoring out indirect, natural and pre-1990 effects

Information needs to be provided on whether or not, and applying what method, estimates of GHG emissions and CO₂ removals factor out CO₂ removals from 3 processes:

1. elevated CO₂ concentrations above pre-industrial levels,
2. indirect N deposition,
3. the dynamic effects of age structure resulting from activities prior to 1990

For the purpose of accounting under the KP, “factoring out” has been addressed through a so-called net-net approach where net change in GHG emissions and CO₂ removals are accounted by comparing GHG emissions and CO₂ removals during the CP with a benchmark under:

- either a base year
- or a business-as-usual scenario, which could also be a scenario in which emissions and removals are assumed to sum to zero

Thank you

questions/comments welcome