United Nations Framework Convention on Climate Change

Refresher seminar for experienced GHG inventory reviewers:

"Transition to the new UNFCCC reporting and review guidelines for GHG inventories, and the IPCC Revised Supplementary Methods and Good Practice Guidance arising from the Kyoto Protocol, including the IPCC Wetland Supplement"

4 March 2015

Bonn, Germany

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Presentation outline

- **Relevant UNFCCC decisions related to LULUCF for CP2**

- **The 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol (KP Supplement)**
  - Background and Overview
  - Chapter 1: Introduction and general guidance
  - Chapter 2: Methods for estimation and reporting
    - Afforestation, Reforestation, Deforestation and Forest Management
    - Natural Disturbances
    - Harvested Wood Products
    - Cropland Management, Grazing Land Management, Revegetation, and Wetland Drainage and Rewetting

- **The 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (Wetlands Supplement)**
  - Background
  - General overview of the main chapters

Relevant UNFCCC decisions related to LULUCF in CP2

Decision 2/CMP.6 (The Cancun Agreements: LULUCF)

http://unfccc.int/resource/docs/2010/cmp6/eng/12a01.pdf#page=5

Decision 2/CMP.7 (Land use, land-use change and forestry)

http://unfccc.int/resource/docs/2011/cmp7/eng/10a01.pdf

Decision 2/CMP.8 (Implications of the implementation of decisions 2/CMP.7 to 5/CMP.7 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol) http://unfccc.int/resource/docs/2012/cmp8/eng/13a01.pdf

Decision 6/CMP.9 (Guidance for reporting information on activities under Article 3, para 3 and 4, of the Kyoto Protocol)

http://unfccc.int/resource/docs/2013/cmp9/eng/09a01.pdf

Decision 2/CMP.7: *the new LULUCF rules for CP2*

LULUCF rules in CP1 and CP2 (in red the main changes):

Land activity	CP1(2008-2012)	CP2(2013-2020)
Afforestation/reforestation (AR)	M (gross-net)	M (gross-net)
Deforestation (D)	M (gross-net)	M (gross-net)
Forest management (FM)	V (gross-net with a cap)	M (reference level, cap on credits)
Cropland management (CM)	V (net-net 1990)	V (net-net 1990)*
Grazing land management (GM)	V (net-net 1990)	V (net-net 1990)*
Revegetation (RV)	V (net-net 1990)	V (net-net 1990)*
Wetland drainage & rewetting (WDR)	-	V (net-net 1990)
Additional provisions		
Harvest wood products (HWP)	-	M
Natural disturbances (ARD, FM)	-	V (emissions can be excluded from FM and AR under specific rules)
Conversion of natural forest to planted forests	-	M (under FM)
Carbon equivalent forests	-	V (under FM)

M: mandatory; V: voluntary

* M if elected in CP1

The 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol (KP Supplement)

Background

The KP Supplement provides supplementary methods and guidance to produce the additional information needed in GHG inventories to fulfill the **new LULUCF rules** for the Kyoto Protocol

The KP Supplement updates and augments the Chapter 4 of the GPG-LULUCF, taking into account:

- Decision 2/CMP.7;
- The 2006 IPCC Guidelines and other IPCC products;
- Other relevant COP and CMP decisions (e.g. 2/CMP.8);
- New scientific literature and methods;

Decision 6/CMP.9: KP Supplement to be applied by AI Parties in CP2

Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg/

Overview

Chapter 1: Introduction

– Steps to estimate and report supplementary information for KPLULUCF activities;
– General rules for categorisation of lands under KP-LULUCF activities.

Main updates linked to new provisions:

- Changes to steps to estimate and report supplementary information;
- Changes of categorization of lands under KP-LULUCF activities;

Chapter 2: Methods for estimation and reporting

Generic and activity-specific methodological guidance on:
– Area identification, stratification and reporting;
– Estimation of C stock changes and non-CO2 GHG emissions.

Main updates on generic methodological issues:

Implementation of C stock change method (2.3.3); Inter-annual variability (2.3.5);

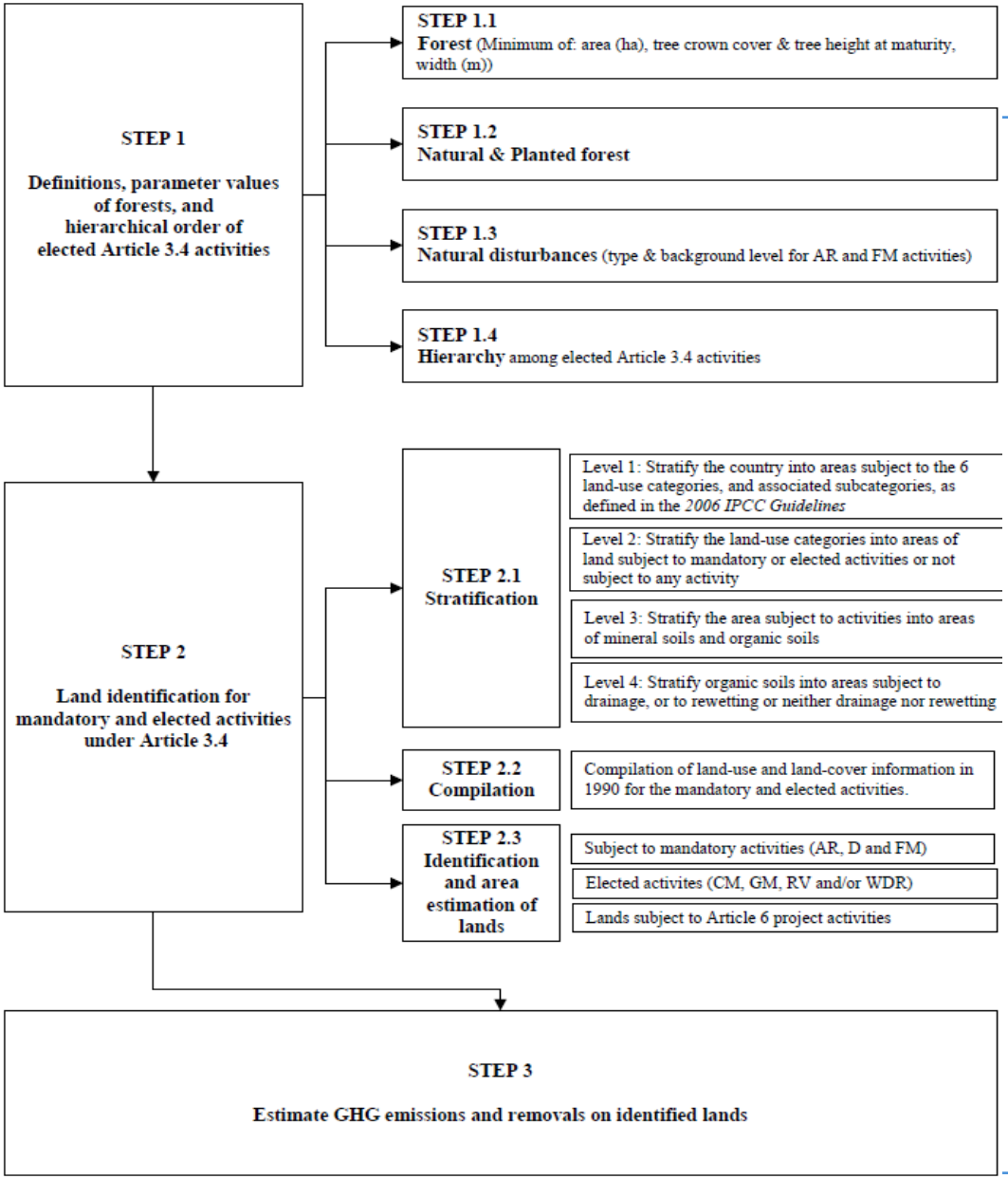
Addition of new sections on:

Natural disturbances in AR and FM lands (2.3.9);
FMRL (2.7.5); Technical Corrections (2.7.6); CEFC (2.7.7); HWP (2.8); WDR (2.12).

KP Supplement

Introduction

Introduction



Some slides in Introduction are taken/modified from Sandro Federici. For a more comprehensive presentation: http://forest.jrc.ec.europa.eu/media/cms_page_media/107/Federeci%2C%20S.%20Steps%20for%20estimating%20KP%20activities%20under%20Art.%203.3%20and%203.4.pdf

Step 1.1: 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: Natural & 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.

STEP 1.3: Natural disturbances

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.

STEP 1.4: Hierarchy among activities

- "Once in, always in", "no double counting".
- D take precedence over AR. If D land subject to subsequent regrowth of forests: continues to be reported under D, as a subcategory;
- AR and D take precedence over FM.
- Mandatory activities (AR, D, FM) take precedence over elected ones;
- Parties establish the reporting hierarchy among elected activities (CM, GM and RV). WDR is by definition the lowest level of the hierarchy
- Land subject to direct human-induced conversion to/from forest reported under AR/D unless a Party chooses to use the CEFC provision and all requirements are met, in which case it is reported under FM;

Introduction

- If both CM and GM elected, all affected land may be reported under one activity
- For CM and GM, 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. For transparency, it is good practice to describe the consequences of this exclusion on reported emissions and removals.

Possible cases (assuming CM elected in CP2):

1) area of CM in 1990 converted to SL in 2000: accounted as zero in CP2.

2) area of CM in 1990 converted to SL in 2015: the zero accounting does NOT apply (because it was not CM in the "base yr only", but also in 2013 and 2014). Applying the zero accounting in this case would violate the principle of permanence in accounting.

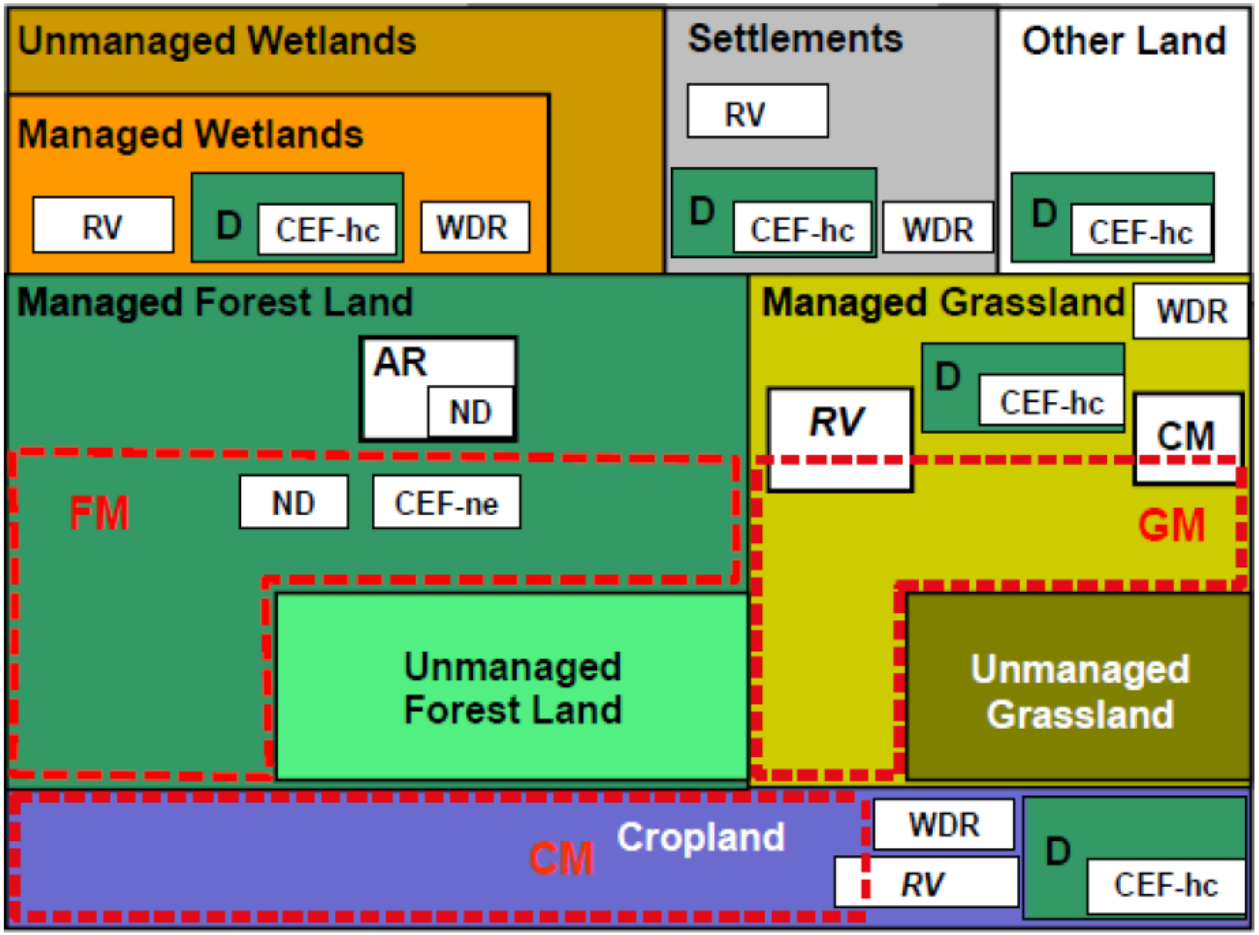
Note that examples 6 and 7 in box 1.1 of IPCC 2013 KP Supplement suggest zero accounting also in case 2. However, this interpretation contradicts the text in other parts of the same document. Main guidance text should take precedence over an example in a box (?)

KP Supplement

Methods for estimation and reporting

Relationship UNFCCC-KP reporting (2.1)

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



Land identification (2.2)

Areas of land subject to Article 3.3 and 3.4 activities must be **identifiable**, adequately reported and **tracked** over time.

Identification and tracking may occur with fully spatially-explicit OR statistical techniques*, i.e. approach 3 should be used or approach 2 + supplementary information**.

* For area under ND or CEFC spatial-explicit identification is needed.

**The supplementary information should be related to rationale for land Identification and tracking, i.e. to associate the correct EF to the relevant AD, to avoid double counting and confusing lands among them, and because “once in, always in”.

In the case of AR/D, the minimum information required (also based on statistics) is the land use that preceded/followed the AR/D event, because the soil C may strongly depend on the previous/following land use.

Generic methodological issues (2.3)

Pools to be reported

A pool can be excluded from accounting if it is **not a source**, with the exception of HWP (and consequently of aboveground biomass).

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.

The lack of proper documentation for “not a source” is one of the most common issue raised during the review during CP1

Completeness of reporting among Annex I countries:

	Above-ground biomass	Below-ground biomass	Litter	Dead wood	Soil Min	Soil Org
AR	97%	97%	81%	53%	89%	46%
D	97%	97%	94%	94%	94%	47%
FM*	100%	100%	70%	78%	57%	65%

* % calculated for those countries which elected FM

Generic methodological issues

Correct implementation of C stock change methods when areas change

To ensure that actual C stock changes are reported, and not artefacts resulting from changes in area over time (rather common mistake during CP1!), the calculations of C stock changes should be implemented in following a specific sequence. See BOX 2.3.3 IPCC 2013 KP Supplement

Interannual variability in GHG estimates

Interannual Variability is determined by 3 factors:

- Natural disturbances (factor out out by ND provison);
- 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 report whether the method used is sensitive to climate and environmental variability. If YES, use the same climate and environmental data for FMRL/BY and for CP estimates

Afforestation/Reforestation & Deforestation (2.5, 2.6)

No big changes in the KP Supplement. Clarifications on:

- Implementation of country's definition of forest;

- Information demonstrating direct human-induced AR activities:
Relevant information includes documentation which demonstrates that a decision has been taken that aimed at replanting or promoting or allowing forest regeneration, for example referencing laws, policies, regulations, management decisions or practices. […] In the absence of such information, forest regrowth as a consequence of abandonment or of environmental change does not qualify as AR.

- Lands subject to D which subsequently gain forest cover still reported under D, as a separate subcategory;

- Clarification on discriminating between deforestation and temporary loss of forest cover

- Relationship with the CEFC provision

Forest management (2.7)

This section include new elements introduced by Decision 2/CMP.7:

- Reporting of emissions arising from the conversion of natural forests to planted forest (2.7.1);
- Methodological requirements related to the Forest Management Reference Level (FMRL, 2.7.5);
- Technical Corrections to FMRL for accounting purposes (2.7.6);
- Reporting and accounting of lands under the Carbon Equivalent Forest Conversion provision (CEFC, 2.7.7).

Forest Management Reference Level (FMRL, 2.7.5)

The FMRL is a value of average annual net emissions and removals from FM, against which the net emissions and removals reported for FM during the 2nd CP will be compared for accounting purposes.

The KP supplement includes:

– Short overview of approaches/methods used and elements considered for FMRL (this information provides the basis for assessing the methodological consistency) (2.7.5.1);

– Methodological consistency related to the FMRL (2.7.5.2);

– Technical Corrections (2.7.6).

The guidance on how to construct the FMRL is provided by Decision 2/CMP.6 and is not repeated in the KP Supplement.

Approaches and methods used for FMRLs

38 Parties submitted FMRLs with following approaches:

1) FMRLs based on projections under a ‘business as usual’ (BAU) scenario. This includes two methods:

   a) model-based projected BAU, with country-specific methodology, or common methodological approach (JRC-IIASA-EFI).

   b) projections based on the elaboration (average/extrapolation) of historical data from GHG inventories, assumed as proxy for a BAU

2) Historical FMRL based on the single year 1990

3) FMRL equal to zero

Methodological consistency

2006 IPCC GL: consistency means that an inventory should be internally consistent in all its elements over a period of years (**time-series consistency**), i.e. the same methodologies and consistent data sets used for all years. In some case different methodologies for different years can be considered consistent if it has been recalculated in a transparent manner, and if potential inconsistencies are minimized following 2006 IPCC GL.

In some case time series consistency may not be achieved, e.g.:

1)Recalculations due to methodological changes / refinements;

a)Methodological change: a switch to a different tier (or method, e.g. from Stock-Difference to Gain-Loss), often driven by new and different data sets.

b)Methodological refinement: same tier used, but different data source, model version or level of aggregation.

Both a) and b) are an essential part of improving inventory quality.

2) Adding new categories (including new C pools and gases).

Forest management

In the context of FMRL **methodological consistency** refers to the need for consistency, during the CP, between the methodological elements used in the FMRL submission and those used in the reporting of FM, i.e.:

(i) *Method* used for FMRL (models or elaboration of historical time series);

(ii) *Historical data* used for FMRL, e.g. (forest area, harvest, increment, etc.);

(iii) *Other elements* used for FMRL (pools/gases, HWP, ND, etc.).

A change in methodological elements used in the construction of FMRL triggers a methodological inconsistency → Technical Correction

By contrast, **a deviation in policy assumptions* under business-as-usual scenario from those assumed in constructing the FMRL does not represent a methodological inconsistency** → no Technical Correction

*** Policy assumptions** include economic assumptions/responses (e.g. harvesting decisions), assumptions on future FM area, on harvesting rates (including variations in harvesting rates as compared to historical period) or amounts, on HWP, etc.

Forest management

Additional considerations on methodological consistency

For projected FMRLs, it is *good practice*:

- **To provide information on main factors generating the Accounted Quantity** (FM - FMRL), e.g., that a higher (or lower) sink during the CP as compared to what assumed in the BAU FMRL is quantitatively consistent with the observed lower (or higher) harvest rate, and/or to provide evidence of other major factors involved → the aim is to show that AQ can be explained as deviations in policy assumptions (e.g., harvest rate) compared to FMRL.
- To show that **model results used for FMRL reproduce the data for FM (or FL-FL) for the historical period** reported in the FMRL submission (i.e. period not affected by deviations from policy assumptions under BAU).
- **Pool consistency**: once a pool has been included in the FMRL, for consistency reasons this pool is required to be reported/ accounted also during the CP, irrespective of the pool being a sink or a source.

Technical correction (2.7.6)

If methodological inconsistency exists between the FMRL and the FM reporting during the CP, to ensure consistency, Parties are required to apply a Technical Correction.

The Technical Correction (TC) is a net value of emissions /removals, which is added at the time of accounting to the original FMRL to ensure that accounted emissions / removals will not reflect the impact of methodological inconsistencies

Technical Correction = $FMRL_{corr}$ - FMRL

CHECK LIST TO DETECT METHODOLOGICAL INCONSISTENCIES AND NEED FOR TC

Criteria		Action
1 The method used for GHG reporting of FM or FL-FL changed after the adoption of FMRL		Calculate $FMRL_{corr}$ ensuring consistency between reported FM and FMRL
2. Any of the following methodological elements used for FMRL (as reported in the FMRL submission) changed after adoption of FMRL		
Element	**Addition /modification in GHG inventory**	
a) Pools and gases	New pools or gases	
b) Area under FM	Recalculated historical data* on area	
c) Historical data for GHG inventory	Recalculated historical data* for FL-FL or FM.	
d) Forest characteristics and management	Recalculated historical data*	
e) Historical Harvesting rates	Recalculated historical data*	
f) Climate data assumed by models for projecting FMRL	Different observed climate data as compared to what assumed in FMRL	
g) Harvested wood products	New/recalculated data and/or methods	
i) Natural disturbances	New/recalculated data and/or method; inclusion of submitted (in 2015) or revised (later) background level and margin with assumptions different from FMRL	
3. Other possible methodological inconsistencies, e.g., the FMRL model's outputs are not capable of reproducing the historical data* reported for FM or FL-FL.		

* data for the time period used in the construction of the FMRL

EXAMPLES OF CASES WHICH MAY LEAD TO METHODOLOGICAL INCONSISTENCY BETWEEN FMRL AND REPORTING OF FM DURING THE 2ND CP

Case 1:

At the time of FMRL submission:

-The GHG inventory used a *Stock-Difference* or *Gain-Loss* (i.e. not a model)

-The FMRL was constructed using model X

Can this country apply a different method in GHG reporting during the 2nd CP?

Yes, but this will create a methodological inconsistency, which triggers a TC.

Can this country apply the model X in GHG reporting?

Yes, this will ensure consistency between the FMRL and FM.

Can this country apply a new model Y in GHG reporting?

Yes, but this will create a methodological inconsistency, which requires a TC. In this case, a possible way to address the inconsistency is using the new model Y also for calculating the $FMRL_{corr}$ as part of the TC process.

Examples of cases which may lead to methodological inconsistency between FMRL and reporting of FM during the 2nd CP

Case 2:

At the time of FMRL submission:

- The GHG inventory used model X

- FMRL was constructed using model X

Can this country use a new model Y (or new version of model X) in GHG reporting?

Yes, this will create a methodological inconsistency, which may be addressed by using the new model Y (or new version of the model X) also for calculating the FMRLcorr as part of a TC process.

Examples of cases which may lead to methodological inconsistency between FMRL and reporting of FM during the 2nd CP

Case 3:

At the time of FMRL submission:

- The GHG inventory used data from NFIs representing the years 1995 and 2005

- FMRL was modelled using historical input data for the period 2000-2009, where 2000-2005 were based on the two NFIs and 2006-2009 were extrapolated using existing NFI-data.

In the year 2012, a new NFI was finalized resulting in a recalculation of data for the period 2006-2009. This triggers a recalculation of the GHG inventory, and consequently a TC has to be applied. The new time series for 2000-2009 including historical data for 2000-2005 and recalculated historical data for 2006-2009 are used for calculating the FMRLcorr. Only data representing the same years as the data used to calculate the initial FMRL shall be used to calculate the FMRLcorr.

HOW TO PERFORM AND DOCUMENT THE CALCULATION OF $FMRL_{CORR}$

Several methods possible, depending on the approach used for FMRL, the cause of the inconsistency and the data available.

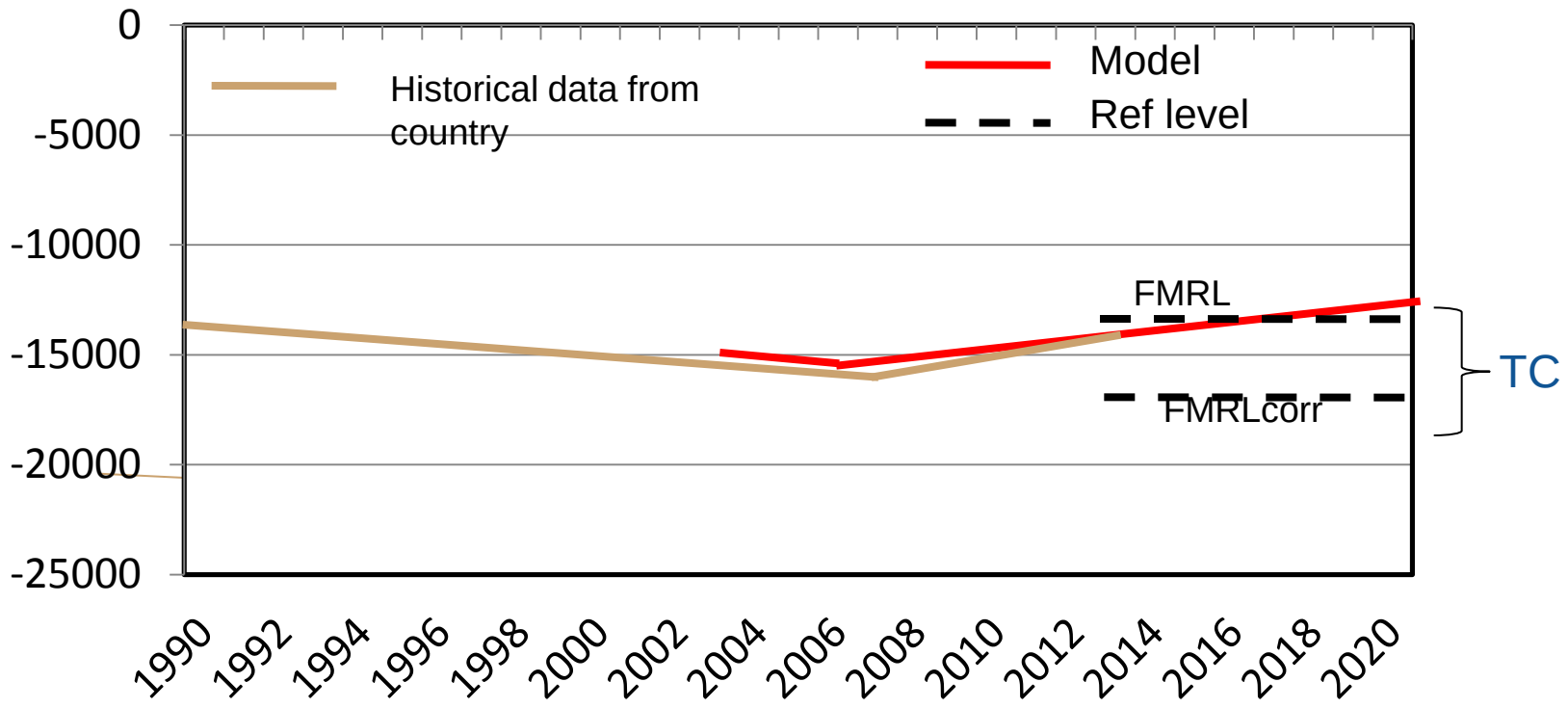
In any case, it is *good practice* to provide information on the rationale for calculating $FMRL_{corr}$ and the method used, and that the method used avoids the expectation of net credits / debits linked to any inconsistency between $FMRL_{corr}$ and FM.

In the case of projected FMRLs, $FMRL_{corr}$ may be calculated by a new model-based projection using new historical data. In this case it is *good practice* :

- *to keep all the policy assumptions of the FMRL submission unchanged*;
- to show that the new model-based calculations used for $FMRL_{corr}$ are capable of *reproducing the data for FM (or FL-FL) for the historical period reported in the FMRL submission* (i.e. period not affected by deviations from policy assumptions), or to provide any explanation if it is not the case.

Forest management

If the need for a TC has been identified, but a new model run cannot be done, time-series consistency may be (*preliminary*) achieved by using one of the methods by 2006 IPCC GL, including the "overlap" between models results and data for the historical period (before the FMRL submission).



When to apply technical correction

Technical Correction shall be applied when accounting.

Information on technical corrections and methodological consistency shall be reported as part of the *annual* GHG inventories and inventory reports. To this aim, it is *good practice* for Parties to assess annually the need for TC, i.e. checking the criteria set in Table 2.7.1, and to report transparent information on this in the annual NIR.

Dec. 2/ CMP.8 specifies that *Parties shall include the FMRL submission and the corresponding technical assessment report as annexes to the* ***initial report****. Any technical corrections resulting from recommendations in the technical assessment report shall be reported in the inventory submission for the first year of the CP2*

Carbon Equivalent Forests Conversion (CEFC, 2.7.7)

Decision 2/CMP.7: Parties may account for emissions / removals resulting from the harvest and conversion of some forest plantations to non-forest land under FM, provided that certain requirements are met (i.e. that a new forest of at least equal area and carbon stock is created on non-forest land).

CEFC is the practice of converting a forest plantation to non-forest land while establishing a “Carbon Equivalent Forest” on non-forest land elsewhere.

CEFC requires two land components – the existing forest land to be harvested and converted to non-forest land (CEF-hc) and the non-forest land on which a forest is to be newly established (CEF-ne).

Natural Disturbances (2.3.9)

Treatment of natural disturbances (ND)

• First commitment period (Decision 16/CMP.1): all emissions and subsequent removals from natural disturbances are to be accounted.

• Second commitment period (Decision 2/CMP.7)

ND defined as ***non-anthropogenic events or non-anthropogenic circumstances that cause significant emissions in forests and are beyond the control of, and not materially influenced by, a Party***.

ND may include wildfires, insect and disease infestations, extreme weather events and/or geological disturbances. Harvesting and prescribed burning excluded.

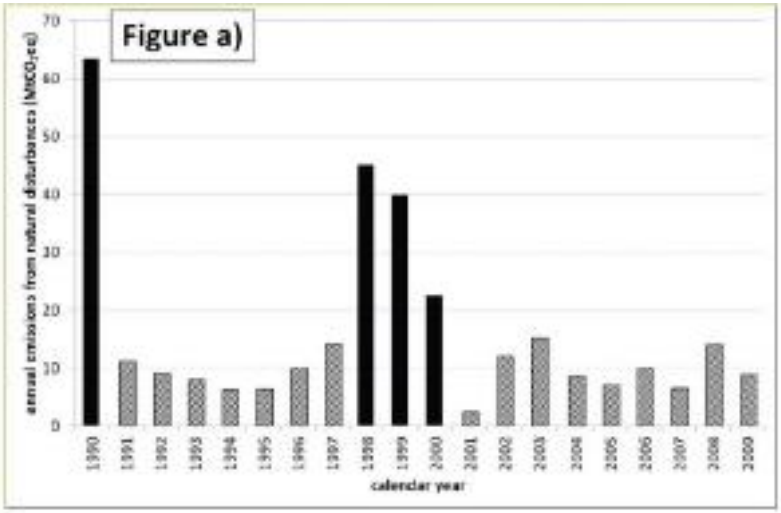
Parties **may exclude from the accounting of AR and FM emissions from natural disturbances** that in any single year exceed a **background level** provided certain conditions are met.

The KP Supplement gives guidance on how Parties can demonstrate that conditions of the natural disturbances provision are met.

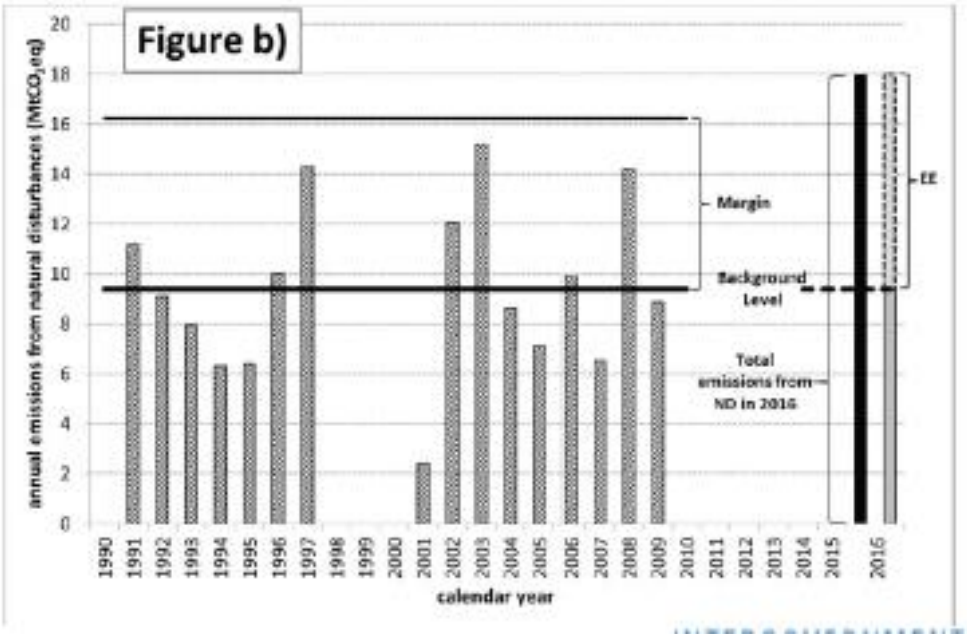
Some slides on ND are taken/modified from Zoltan Somogyi. For a more comprehensive presentation: http://forest.jrc.ec.europa.eu/media/cms_page_media/107/Somogyi%2C%20Z.%20Natural%20Disturbances.pdf

Natural Disturbances

Default method



- Removal of *outliers* in the time series of emissions
- The **background level** is estimated as mean, and the **margin** as twice the standard deviation, of the remaining emissions

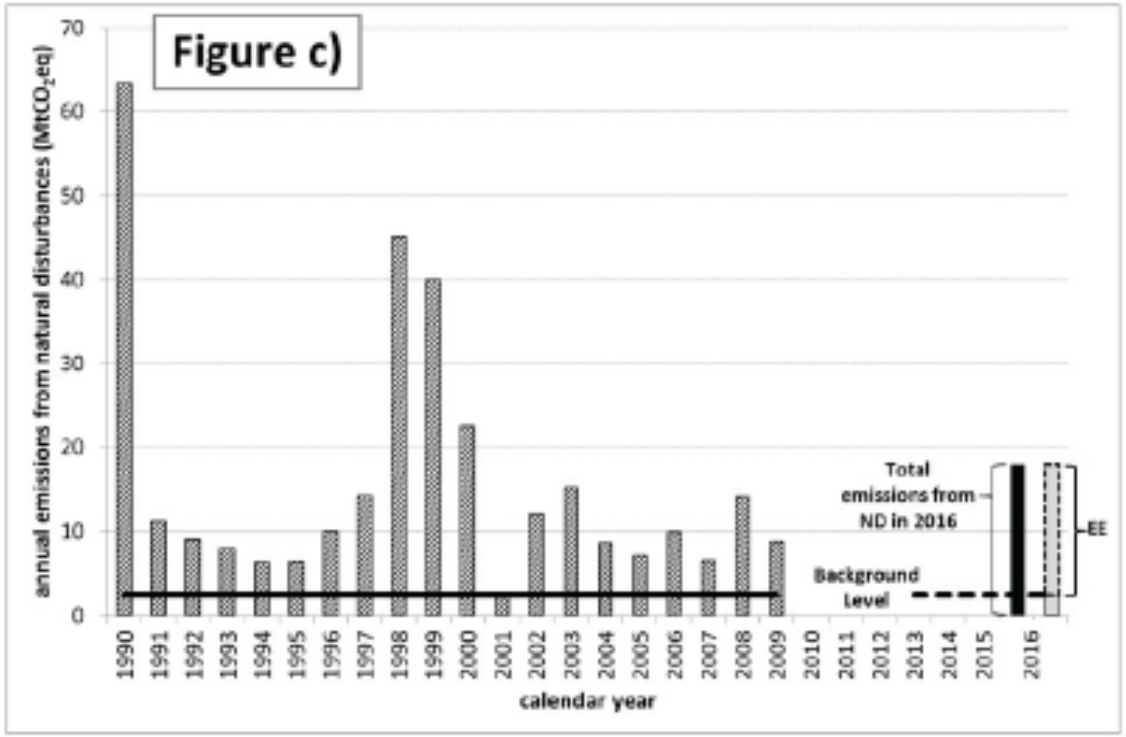


During the CP, emissions are only excluded from accounting when the annual emissions are greater than the background level plus the margin. When this occurs, emissions are only excluded which are greater than the background level.

Natural Disturbances

Alternative method

Example: the **background level** equals the minimum emission in the time series, and the margin is set equal to zero.



During the CP, when emissions from natural disturbances exceed the background level, the emissions above the background level may be excluded

Natural Disturbances

Conditions required to exclude emissions:

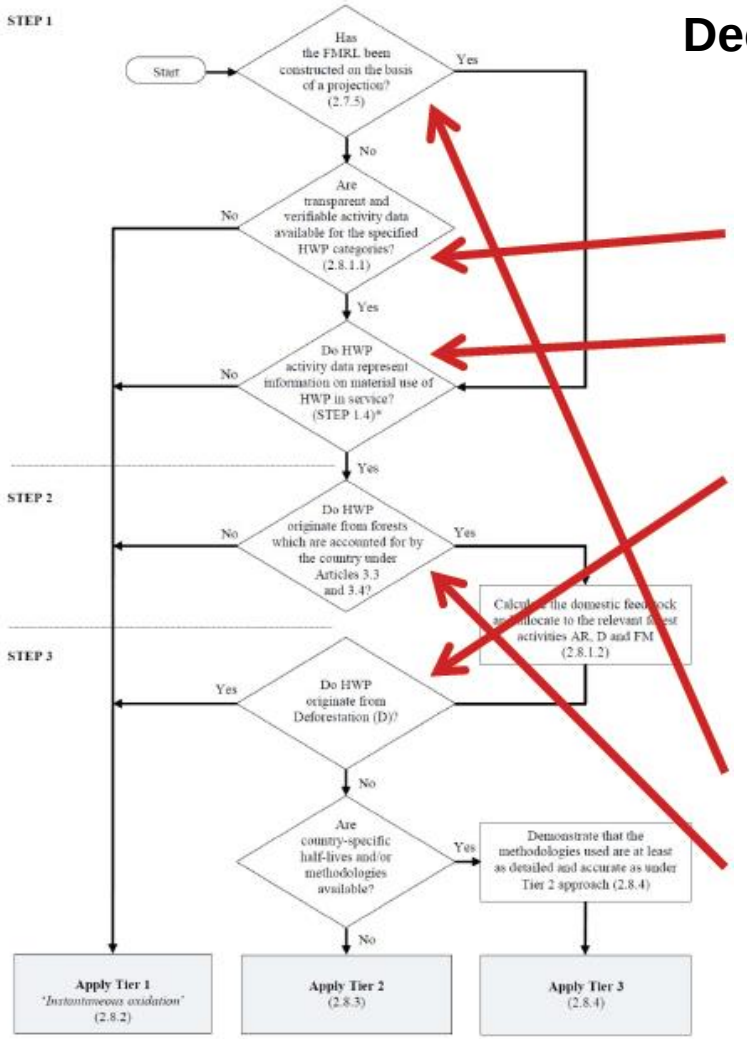
In 2015 the NIR should include:

- Intention to apply the provision to FM and/or AR
- Information on: FM background level (BL) of ND emissions *that have been included in FMRL;* an AR BL; how BL has been estimated; how to avoid the *expectation of net credits or net debits during the CP*

In specific years of CP2, the NIR should include information on:

- How affected lands are identified, including their *geo-referenced location*
- How annual emissions and the subsequent removals are estimated. Emissions from *salvage logging* shall not be excluded from accounting, while *removals that are additional to those included in the FMRL* shall be excluded from the accounting
- No *land-use change* has occurred on lands where NS is applied
- ND were *beyond the control* of, and not materially influenced by, the Party; practicable efforts were done to prevent or control the NDs
- How consistency with FMRL is ensured

Harvested Wood Products (2.8)



Decision tree and description of STEPS

Default: Instantaneous oxidation
(2/CMP.7, paragraph 28)

- No transparent and verifiable activity data (2/CMP.7, paragraph 29 and 30)
- HWP in solid waste disposal sites and wood harvested for energy purposes (2/CMP.7, paragraph 31)
- HWP from deforestation (2/CMP.7, paragraph 32)

Accounting of HWP on the basis of change of the pool
(2/CMP.7, paragraphs 29 and 30)

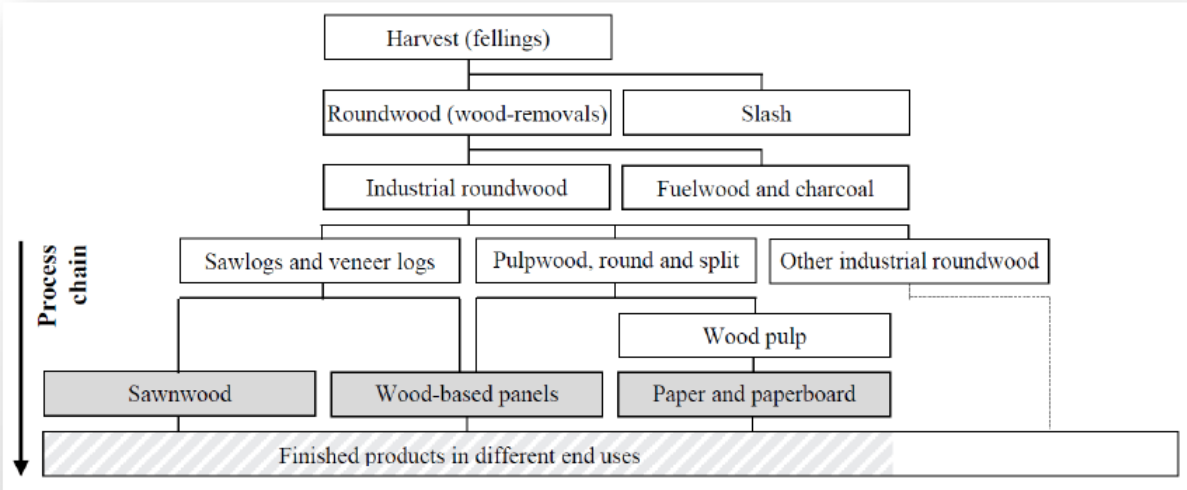
- Mandatory if projected FMRL has been used (2/CMP.7, paragraph 16)
- HWP removed from forests which are accounted for by the country (2/CMP.7, paragraph 27)

Some slides on HWP are taken/modified from Sebastian Rüter. For a more comprehensive presentation: http://forest.jrc.ec.europa.eu/media/cms_page_media/107/Ruter%2C%20S.%20Harvested%20Wood%20Products..pdf

Harvested Wood Products

STEP 1: Check the construction of the FMRL and the availability of transparent and verifiable activity data on HWP (2.8.1.1 & 2.8.4.1)

•Guidance on internationally agreed classification system of wood products (FAO) and definitions of semi-finished wood products (sawnwood, wood-based panels, paper and paperboard) and of feedstock categories to be used as default for estimating HWP from domestic forests (roundwood, industrial roundwood, pulp)

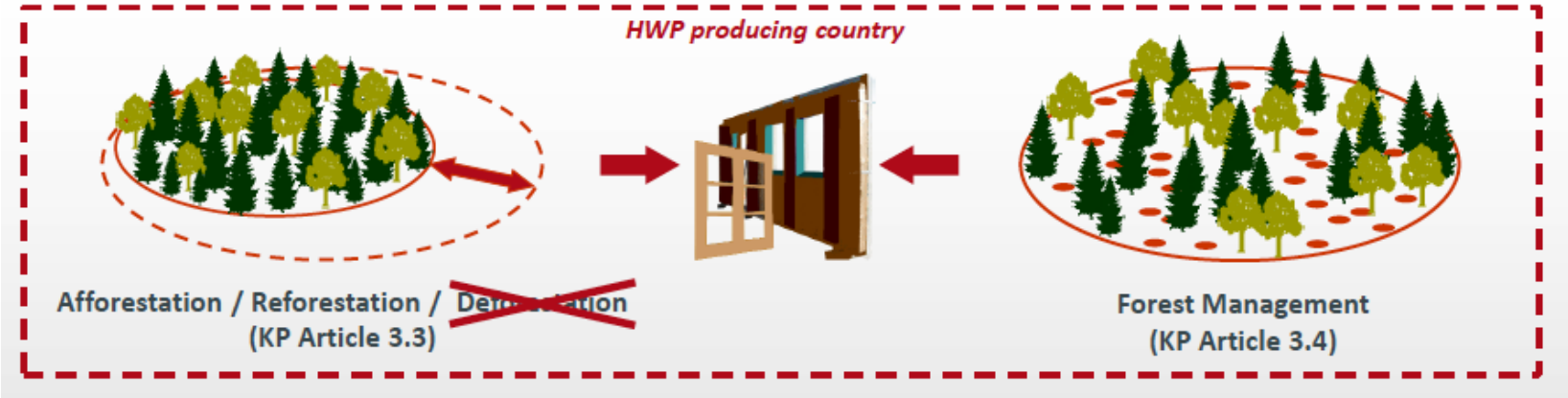


•Examples of different processing stages of wood products along the process and value chain in order to avoid double counting

Harvested Wood Products

STEP 2: Check whether HWP categories originate from domestic forests and allocate HWP to the particular forest related activity (2.8.1.2)

- STEP 2.1: Estimation of share of carbon in HWP coming from domestic forests
- STEP 2.2: Allocation of HWP to the particular forest activities FM, AR and D
- STEP 2.3: Combination of results from Steps 2.1 and 2.2 to obtain the annual fractions of HWP entering the accounting framework



In case it is not possible to differentiate between the harvest from AR and FM, it is conservative and in line with good practice to assume that all HWP originate from FM

Harvested Wood Products

STEP 3: check availability of country-specific information and estimate carbon stock in HWP and its annual change (2.8.2 – 2.8.4)

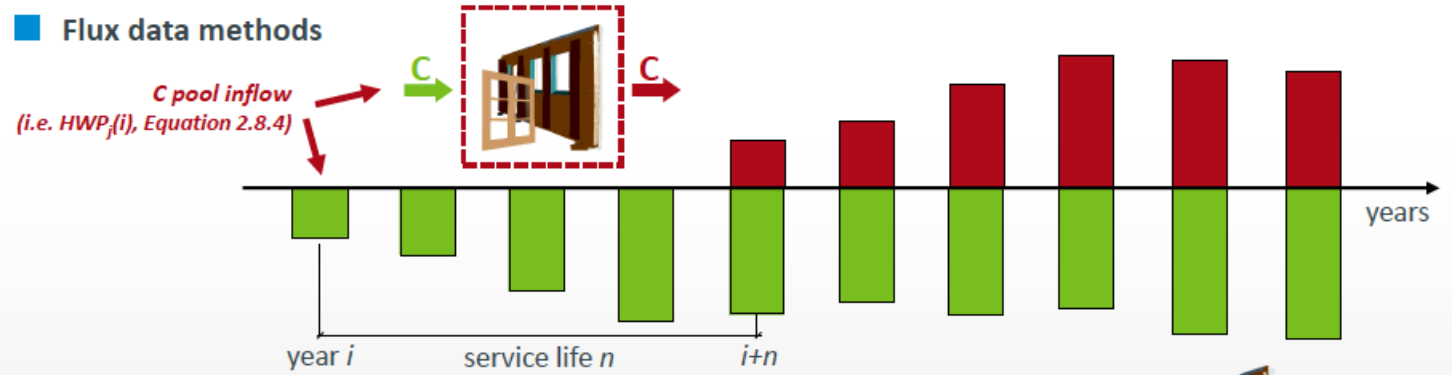
Methods described with detailed sections on AD and EF

Tier 1: instantaneous oxidation (D & waste/energy, not for projected FMRL)

Tier 2: combination of HWP activity data following the international classification system of semi-finished wood products with first order decay method, default conversion factors and default half-lives.

Tier 3: more accurate country specific methods and information are applied.

HWP estimates calculated by means **of flux data methods** (annual carbon inflow based on annual statistical data on production and trade) allow estimating C pool change (i.e. net-emissions) on annual basis



HWP pool in FMRLs (2.8.5)

- Guidance on methodological consistency between HWP in FMRL and the reporting during CP2

  Since the guidance on HWP available only since Decision 2/CMP.7 (2012), further specified in IPCC 2013 KP Supplement, all the HWP estimates included in the FMRL submission (2011) need to be technically corrected due to:

  - Allocation of HWP to activities (AR/FM & D)
  - Application of instantaneous oxidation for HWP originating from D
  - New calculation method for inherited emissions
  - New harvest information based on latest forest inventories (prior to CP2)
  - New conversion factors

Elected 3.4 activities

Cropland & Grazing Land Management (CM & GM)

Update from GPG-LULUCF:

– Clarifications on identification of lands and management activities;

– Country examples of CM and GM implementation;

– More examples (national approaches for perennial crops, how to quantify effects of discontinuous soil measures with spatially non-explicit data and Tier 1 methodologies).

Revegetation (RV)

– Some clarifications;

– Country examples of RV implementation;

– Updated guidance considering 2006 IPCC GL

Wetland Drainage and Rewetting (WDR)

Definitional issues and guidance for the hierarchy:

– Drainage and rewetting measures can occur in any Activity;

– Drainage and rewetting measures since 1990 on land not accounted for under any other Activity is eligible as WDR.

Land identification in 1990 and commitment period:

– 1990 approach differs from other Activities (CM/GM/RV): to account for emission reductions by rewetting, land in 1990 must be the same as in commitment period;

– Land area in 1990 and commitment period grow over time when new measures that change the drainage / wetness state of land are performed.

2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands

(Wetlands Supplement)

Slides largely taken from IPCC TFI TSU (presentation by Nalin Srivastava) For a more comprehensive presentation: http://forest.jrc.ec.europa.eu/media/cms_page_media/107/Srivastava%2C%20N.%20Introduction%20to%202013%20IPCC%20%20WDR.pdf

Background

The *Wetlands Supplement* provides guidance for estimating anthropogenic emissions and removals from wetlands and drained soils.

Need for Additional Guidance on Wetlands:

- 2006 IPCC GL included guidance on a few wetland types
- Since then scientific knowledge has increased
- The UNFCCC has decided to include WDR as a new elected activity

Compared to the *2006 IPCC Guidelines* the Wetlands Supplement provides:

- Updated guidance on ***inland drained organic soils***
- New guidance on the ***rewetting of organic soils*** (including peatlands), on ***coastal wetlands,*** on ***inland wetland mineral soils*** and on ***constructed wetlands for wastewater treatment***

Decision 6/CMP.9: Wetland Supplement shall apply for providing information on WDR; *encouraged* but *not mandatory* for other activities.

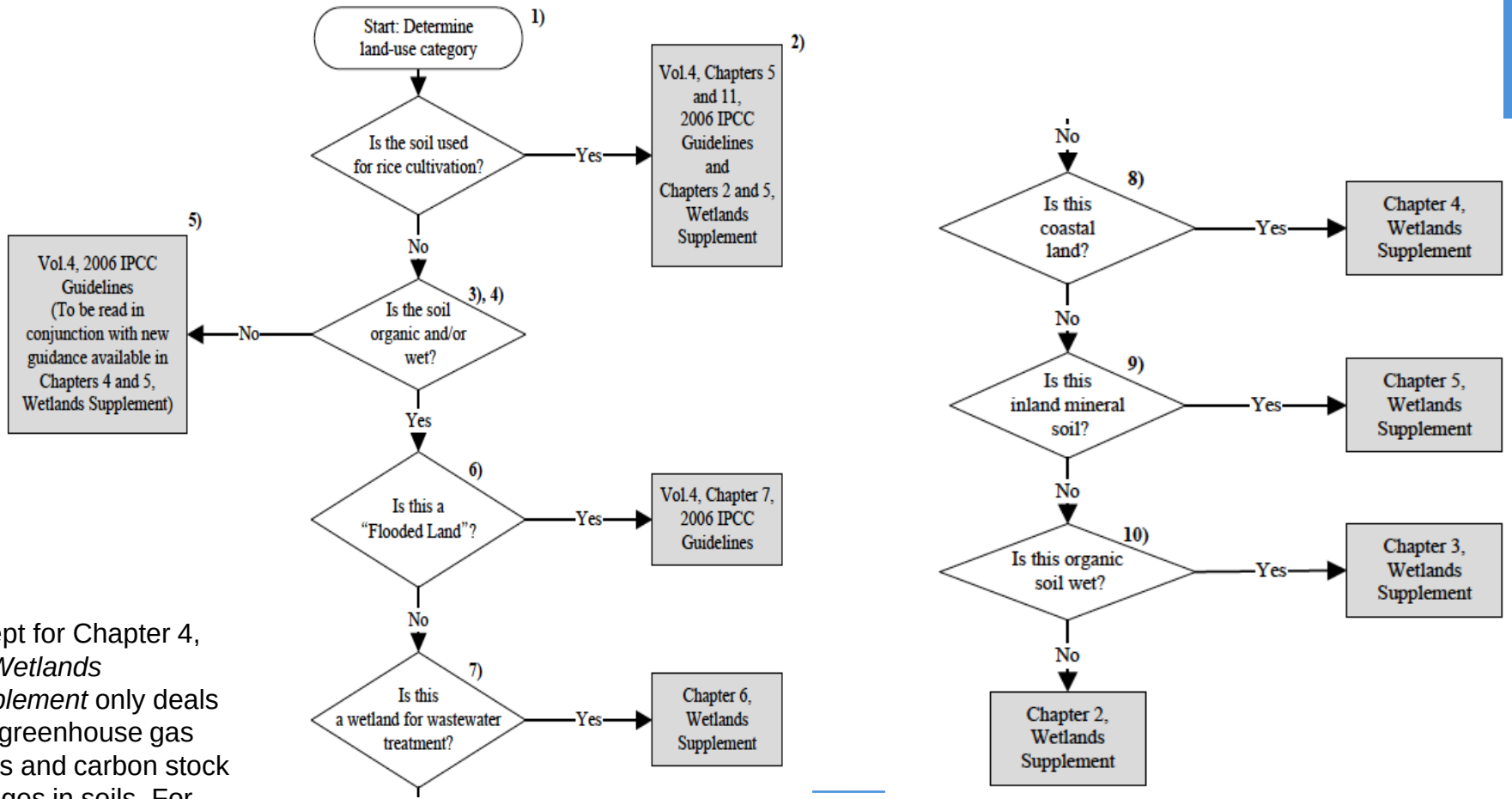
Available: http://www.ipcc-nggip.iges.or.jp/public/wetlands/index.html

Structure

- Chapter 1: Introduction
- Chapter 2: Drained Inland Organic Soils
- Chapter 3: Rewetted Organic Soils
- Chapter 4: Coastal Wetlands
- Chapter 5: Inland Wetland Mineral Soils
- Chapter 6: Constructed Wetlands for Wastewater Treatment
- Chapter 7: Cross-cutting Issues and Reporting

Chapter 1: Introduction

General guidance and information on the linkages between the 2006 Guidelines and the *Wetlands Supplement*



Except for Chapter 4, the *Wetlands Supplement* only deals with greenhouse gas fluxes and carbon stock changes in soils. For guidance on other pools, refer to the *2006 IPCC Guidelines*.

Managed Land Proxy

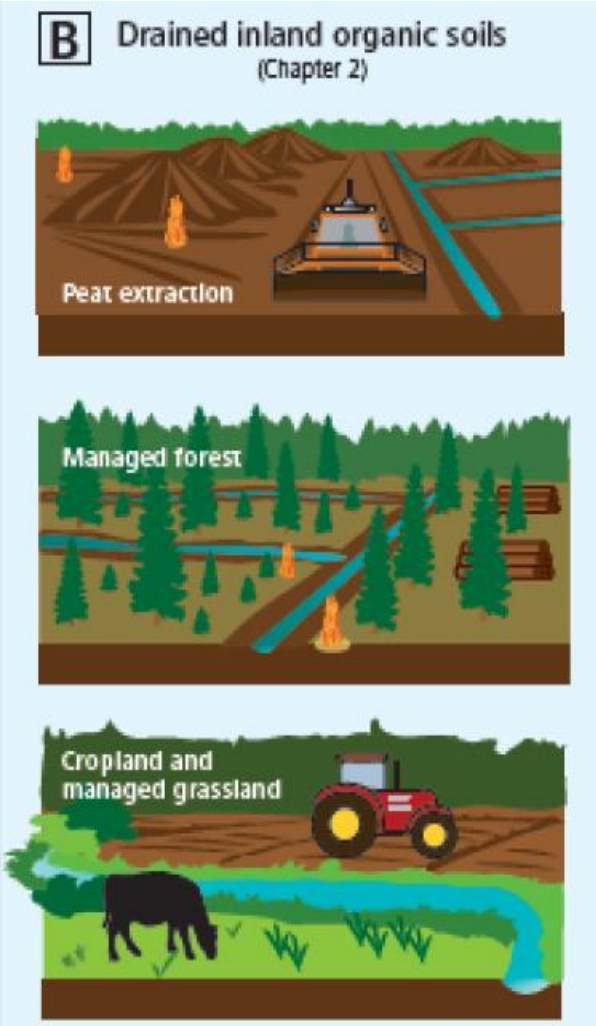
The *Wetlands Supplement* continues to use the “managed land proxy” to estimate anthropogenic emissions & removals.

Anthropogenic emissions & removals are those that occur on managed land – where managed land is defined broadly as covering production, ecological and social purposes.

The *2006 IPCC Guidelines* restricted **managed wetlands** to those lands where the water table is artificially changed (e.g., drained or raised) or those created through human activity (e.g., damming a river).

The *Wetlands Supplement* extends this coverage also to include wetlands constructed for wastewater treatment, or where emissions and removals from coastal wetlands are attributed to specified human activities.

Chapter 2: Drained Inland Organic Soils



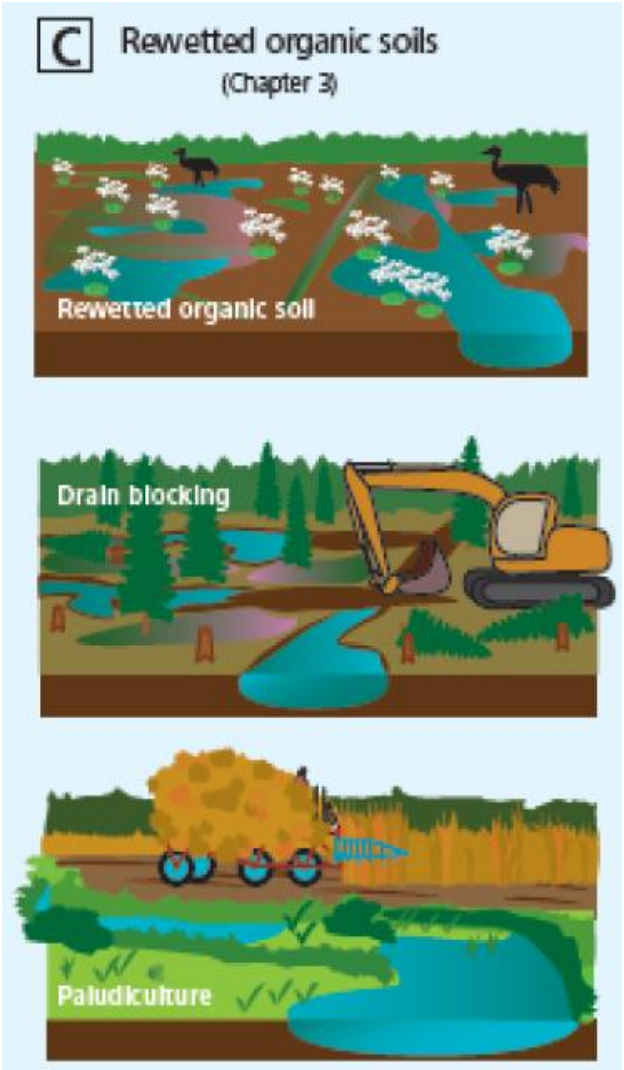
Coverage:

- Drained inland organic soils in all UNFCCC land-use categories where:
  - drainage has started in the past and still persists
  - newly drained lands within the reporting period

Updates:

- updated guidance for managed inland organic soils including land drained for forestry, cropland, grassland, and settlements across climate zones
- updated emission factors for CO2, N2O, activity data
- new guidance on Dissolved Organic C and CH4 from ditches
- new guidance on emissions from peat fires

Chapter 3: Rewetted Organic Soils



Coverage:

Rewetting is the deliberate action of raising the water table of drained soils to re-establish water saturated conditions, and can have several objectives, e.g. wetland restoration. It:

- Can only occur on soils previously drained;
- Generally reduces CO_2 and N_2O and increases CH_4 emissions;
- Can promote vegetation leading to a CO_2 sink;
- Generally reduces losses of dissolved organic C;

Updates:

New guidance on GHG emissions from rewetted organic soils including boreal, temperate, and tropical wetlands occurring in any land-use category.

CONCLUSIONS

In addition to the "normal" checks, the new LULUCF rules require the ERT to check the following issues:

NEW Provision	Where	What to check
Forest management (FM)	KP-Suppl 2.7.5, 2.7.6	Methodological consistency between FM and FMRL (technical correction)
Harvest wood products (HWP)	KP-Suppl 2.8	Methodological consistency between HWP in FM and in FMRL, consistency with FAO data
Natural disturbances (ARD, FM)	KP-Suppl 2.3.9	Methodological consistency between ND in FM and in FMRL, background level and margin, conditions required to exclude emissions
Conversion of natural forest to planted forests	KP-Suppl 2.7.5, 2.7.6	GHG estimates reported separately
Carbon equivalent forests conversion	KP-Suppl 2.7.7	Consistency between FM and FMRL, all the requirements are met
Wetland drainage & rewetting (WDR)	KP-Suppl 2.12. Wetlands Ch. 2 and 3	Land identification and GHG estimation follow IPCC guidance

CONCLUSIONS

NEW Guidance	Where	What to check
Forest definition	KP-Suppl 1.2	Documentation on criteria used to exclude from forest any areas which meet the thresholds for forest, and description of the consequences on accounting
Land identification	KP-Suppl 1.3, 2.2	D land subject to subsequent regrowth of forests continues to be reported under D as a subcategory; WDR; CEFC; CM/GM during CP2
Generic methodological issues	KP-Suppl 2.3	Not a source for aggregated pool; Correct implementation of C stock change methods when areas change; Interannual variability in GHG estimates
AR, D	KP-Suppl 2.5, 2.6	Enhanced guidance on direct human-induced; CEFC
CM, GM, RV	KP-Suppl 2.9-2.11	Land identification and GHG estimation reflect the minor changes in IPCC KP Suppl

Thank you!

NEW KP-LULUCF TABLES

= new table or important change

NIR-1

Activity		CHANGE IN CARBON POOL REPORTED[1]							GREENHOUSE GAS SOURCES REPORTED[2]							
		Above-ground biomass	Below-ground biomass	Litter	Dead wood	Soil		HWP[4]	Fertilization[5]	Drained, rewetted and other soils[6]		Nitrogen mineralization in mineral soils[6]	Indirect N_2O emissions from managed soil[5]	Biomass burning[9]		
						Mineral	Organic[3]		N_2O	CH_4[7]	N_2O	N_2O	N_2O	CO_2[10]	CH_4	N_2O
Article 3.3 activities	Afforestation and reforestation															
	Deforestation															
Article 3.4 activities	Forest management															
	Cropland management															
	Grazing land management															
	Revegetation															
	Wetland drainage and rewetting															

NIR-2, NIR-3, 4(KP) no major changes

4(KP)Recalculations

Activities	CO_2			
	Previous submission	Latest submission	Difference	Difference[11]
	(kt)			(%)
4 (KP). Land Use, Land-Use Change and Forestry				
4 (KP-I) A.1 Afforestation and reforestation				
Carbon stock change in above-ground biomass				
Carbon stock change in below-ground biomass				
Net carbon stock change in litter				
Net carbon stock change in dead wood				
Net carbon stock change in mineral soils				
Net carbon stock change in organic soils				
Net carbon stock change in HWP				
4 (KP-I) A.2 Deforestation				
Carbon stock change in above-ground biomass				

Afforestation/Reforestation

4(KP-I)A.1

GEOGRAPHIC LOCATION [2]	ACTIVITY DATA			
Identification code	Subdivision [3]	Area subject to the activity	Area of mineral soils	Area of organic soils [4]
		(kha)		
Total for activity A.1 [11]				
Subtotal				
Land subject to natural disturbances [12]				
Subtotal				

4(KP-I)A.1.1

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

4(KP-I)A.2

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				
Total for activity (kha)				
Forest land				
Cropland				
Grassland				
Wetlands				
Settlements				
Other land				

4(KP-I)A.2.1

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

4(KP-I)B.1

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					

4(KP-I)B.1.1

Approach applied for FMRL (1)	Value inscribed in the Appendix to the annex to decision 2/CMP.7 (2)	Technical correction (3)
	($kt\ CO_2\ eq/yr$)	
Drop-down list		
Business-as-usual projection		
Base year		
Zero at 1 January 2013		

4(KP-I)B.1.2: CEFC

4(KP-I)B.1.3

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),				

NIR-2.1

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)	

Cropland / Grazing Land management / Revegetation

4(KP-I)B.2 / 4(KP-I)B.3 / 4(KP-II)B.4

GEOGRAPHIC LOCATION[3]	ACTIVITY DATA			
Identification code	Subdivision[4]	Area subject to the activity	Area of mineral soils	Area of organic soils
		(kha)		

Wetland drainage and rewetting

4(KP-II)B.4

GEOGRAPHICAL LOCATION[3]	ACTIVITY DATA			
Identification code	Subdivision[4]	Area subject to the activity	Area of organic soils	
			Drained	Rewetted
		(kha)		
Total for activity B.5				

Harvested Wood Products

4(KP-I)C

ORIGIN OF WOOD			PRODUCT TYPE		
		Harvest[2]	HWP categories[3]	Subcategories[4]	
TOTAL			TOTAL		
Article 3.3 activity	From land subject to afforestation/reforestation		Total for HWP_{AR}		
			Total for category		
			e.g. sawn wood		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
	From land subject to Deforestation[5]		Total for HWP_{AR}		
			Total for category		
			e.g. sawn wood		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
Article 3.4 activity	From land subject to forest management		Total for HWP_{FM}		
			Total for category		
			e.g. sawn wood		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
			Total for category		
			...		Drop-down list: Domestically consumed / Exported
Information items					
Harvest originating from deforestation events[6]					
Harvest from remaining lands[6]					

4(KP-II)1 to 4(KP-II)4: different coverage/aggregation compared to current 5(KP-II)1 to 5(KP-II)5

Accounting

GREENHOUSE GAS SOURCE AND SINK ACTIVITIES	Base Year[2]	NET EMISSIONS/REMOVALS									Accounting parameters	Accounting quantity[4]
		2013	2014	2015	2016	2017	2018	2019	2020	Total[3]		
	(kt CO_2 eq)											
A. Article 3.3 activities												
A.1. Afforestation/reforestation												
Excluded emissions from natural disturbances[5]												
Excluded subsequent removals from land subject to natural disturbances[6]												
A.2. Deforestation												
B. Article 3.4 activities												
B.1. Forest management												
Net emissions/removals												
Excluded emissions from natural disturbances[5]												
Excluded subsequent removals from land subject to natural disturbances[6]												
Any debits from newly established forest (CEF-ne)[7],[8]												
Forest management reference level (FMRL)[9]												
Technical corrections to FMRL[10]												
Forest management cap[11]												
B.2. Cropland management (if elected)												
B.3. Grazing land management (if elected)												
B.4. Revegetation (if elected)												
B.5. Wetland drainage and rewetting (if elected)												