



FOREST MONITORING FOR POLICIES

AA FORMONPOL

- Update of Note 2 of deliverable of Task 2.A-

Assessment of Tiers methods used for LULUCF reporting and their compliance with Regulation (EU) 2018/841

Raúl Abad Viñas

European Commission
Joint Research Centre
Directorate D – Sustainable Resources - Bio-Economy Unit
Raul.abad-vinas@ec.europa.eu

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Joint
Research
Centre

Administrative arrangement - FORMONPOL

General Objective

Support quality improvement of LULUCF inventories towards requirements in Reg (EU). 2018/841

Specifically for the note 2 of the Task 2.A report

*Assess the reporting status of LULUCF inventories with compliance with Article 18 (4)
Identify areas of the LULUCF reporting in which countries encounter major difficulties to comply with reporting requirements*

Regulation (EU) 2018/841

Article 18 (4):

*“For emissions and removals for a **carbon pool** that accounts for at least **25-30 %** of emissions or removals in a source or sink **category which is prioritized** within a Member State’s national inventory system because its estimate has a significant influence on a country’s total inventory of greenhouse gases in terms of the absolute level of emissions and removals, the trend in emissions and removals, or the uncertainty in emissions and removals in the land-use categories, **at least Tier 2** methodology in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (GHGIs).”*



Tier 2, at least, for estimating carbon pools that account for >25-30% of emissions or removals in a key category

Preliminary assessment of the significance of the carbon pools

“Tier 2 methods (at least) for estimating carbon pools that are significant within a KC”

BUT,

Assumption of equilibrium is widely used in the absence of country-specific data and when the Tier 1 in the 2006 IPCC GL consider “equilibrium” in the long term carbon stocks.

(i.e. for these pools we do not have a quantitative estimate of carbon stock changes)

QUESTION:

How do we know which carbon pools need to be reported with higher Tiers if we do not have quantitative estimates that allow to know their significance?

POSSIBLE INTERIM SOLUTION:

To use as a proxy value of the significance of a non-reported pool the average of the significances reported by other MS.

Some thoughts when looking at the results.....

- The information is based on GHGI **submission 2022**.
- Differentiation is done only between **T1 vs higher tiers 2/3**.
- The information in the NIRs is not always transparent enough to **unequivocally assign a single Tier**.
- The analysis is carry out only for **main “remaining”** categories.
- The approach could be **refined** by stratifying the proxy value of the significance (e.g. GEZs, managements, climate zones)
- The KC and the significance of the pools are not constant on time.
- The significance of pools within a category **is interlinked**. when a pool is not reported other increase their significance.
- **SOC_{ORG}** areas are relatively small as compared with SOM_{min} , so their significant could appears not as high as SOM_{min} but their emissions per unit of area are substantially larger.

Forest land remaining forest land

- KC according the CRF table 7.
- (i) Non-compliance based on MS data.
- (ii) Potentially non-compliance based on proxy data.
- Assumed in balance under the Tier 1 methods.

MS	Living biomass		Dead wood		Litter		SOC mineral		SOC organic	
	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method
AT	64%	T2,3	4%	T2,3	IE	T2,3	32%	T2,3		
BE	100%	T2,3	T1		T1		T1			
BG	94%	T2,3	6%	T2,3	T1		T1			
HR	100%	T2,3	T1		T1		T1			
CY	100%	T2,3	T1		T1		T1			
CZ	81%	T2,3	5%	T2,3	12%	T2,3	2%	T2,3		
DK	63%	T2,3	3%	T2,3	22%	T2,3	T1		12%	T2,3
EE	64%	T2,3	3%	T2,3	T1		25%	T2,3	8%	T2,3
FI	65%	T2,3	IE	T2,3	IE	T2,3	18%	T2,3	17%	T2,3
FR	92%	T2,3	8%	T2,3	T1		T1			
DE	63%	T2,3	6%	T2,3	0,8%	T2,3	26%	T2,3	4%	T2,3
GR	100%	T2,3	T1		T1		T1			
HU	85%	T2,3	11%	T2,3	T1		T1		3%	T1
IE	50%	T2,3	IE	T2,3	7%	T2,3	1%	T2,3	42%	T2,3
IT	97%	T2,3	1%	T2,3	2%	T2,3	T1			
LV	66%	T2,3	26%	T2,3	T1		T1		8%	T2,3
LT	87%	T2,3	13%	T2,3	T1		T1		IE	T1
LU	89%	T2,3	11%	T2,3	T1		T1			
MT	100%	T2,3	T1		T1		T1			
NL	78%	T2,3	5%	T2,3	14%	T2,3	T1		3%	T2,3
PO	85%	T2,3	3%	T2,3	T1		9%	T1	3%	T1
PT	98%	T2,3	IE	T2,3	1%	T2,3	2%	T2,3		
RO	100%	T2,3	T1		T1		T1		0,1%	T1
SK	90%	T2,3	10%	T2,3	T1		T1			
SI	90%	T2,3	10%	T2,3	T1		T1			
ES	100%	T2,3	T1		T1		T1			
SE	49%	T2,3	11%	T2,3	12%	T2,3	19%	T2,3	8%	T2,3
IS	99%	T2,3	T1		T1		T1		1%	T1
Average	84%		8%		9%		15%		9%	

- Extensive use of Tier 1 methods.
- DW and LT appear as carbon pools not “formally” significant. Although Tier 1 could comply with Art.18 (4) does not with Art. 5, which require the account for DW under MFL,
- SOM_{min} reported only for 9 countries appears in average not significance it is for some of them.
- SOC_{ORG} widely reported with Tier 1 method appear as not significance

Empty cells in organic soils is due to the lack of these areas in the category

Cropland remaining cropland

- KC according the CRF table 7.
- (i) Non-compliance based on MS data.
- (ii) Potentially non-compliance based on proxy data.
- Assumed in balance under the Tier 1 methods.

MS	Living biomass		Dead organic matter		SOC mineral		SOC organic	
	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method
AT	20%	T2,3	T1		80%	T2,3		
BE	2%	T2,3	T1		50%	T2,3	48%	T1
BG	7%	T1	T1		88%	T2,3	5%	T1
HR	66%	T1	T1		8%	T2,3	27%	T1
CY	100%	T1	T1		----			
CZ	24%	T1	T1		76%	T2,3		
DK	1%	T2,3	T1		11%	T2,3	88%	T2,3
EE	1%	T2,3	T1		37%	T2,3	62%	T2,3
FI	0,04%	T2,3	IE	T2,3	11%	T2,3	89%	T2,3
FR	16%	T2,3	T1		84%	T2,3	IE	T2,3
DE	1%	T2,3	T1		1%	T2,3	99%	T2,3
GR	70%	T2,3	T1		----		30%	T1
HU	12%	T2,3	T1		88%	T2,3		
IE	35%	T1	T1		65%	T1		
IT	18%	T2,3	T1		64%	T2,3	18%	T1
LV	1%	T2,3	0,04%	T2,3	----		99%	T1
LT	35%	T1	T1		65%	T2,3	IE	T1
LU	79%	T1	T1		21%	T2,3		
MT	66%	T2,3	T1		34%	T1		
NL	----		T1		----		100%	T2,3
PO	63%	T1	T1		12%	T1	25%	T1
PT	85%	T2,3	T1		15%	T2,3		
RO	14%	T2,3	T1		79%	T1	8%	T1
SK	94%	T2,3	T1		6%	T2,3		
SI	8%	T1	2%	T2,3	3%	T1	88%	T1
ES	36%	T2,3	T1		64%	T2,3		
SE	4%	T2,3	0,22%	T2,3	18%	T2,3	78%	T1
IS	----		T1		2%	T2,3	98%	T1
Average	33%		1%		41%		60%	

- Reported for 2020 as **KC most of the inventories**
- **LB** shows 3 non-compliance and 2 potentially non-compliance cases. In some cases, the pool is only reported from changes among “annual” and “woody” crops.
- **DOM** reported for 4 countries and appears with very low significance.
- **SOM_{min}** shows 1 non-compliance, and 4 potentially non-compliance cases. When not reported the justification is often the lack of change in the management across the years.
- **SOC_{ORG}** widely reported with Tier 1 method despite of the high significance of its emissions.

Grassland remaining grassland

- KC according the CRF table 7.
- (i) Non-compliance based on MS data.
- (ii) Potentially non-compliance based on proxy data.
- Assumed in balance under the Tier 1 methods.

MS	Living biomass		Dead organic matter		SOC mineral		SOC organic	
	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method
AT	----		T1		3%	T2,3	97%	T1
BE	----		T1		89%	T2,3	11%	T1
BG	4%	T1	T1		72%	T2,3	23%	T1
HR	----		T1		----		100%	T1
CY	100%	T1	T1		----			
CZ	----		T1		100%	T2,3		
DK	2%	T2,3	T1		IE	T2,3	98%	T2,3
EE	----		T1		----		100%	T2,3
FI	13%	T2,3	T1		----		87%	T2,3
FR	74%	T2,3	T1		26%	T2,3	IE	T1
DE	4%	T2,3	T1		1%	T2,3	96%	T2,3
GR	100%	T2,3	T1		----			
HU	----		T1		100%	T2,3		
IE	----		T1		13%	T1	87%	T1
IT	48%	T2,3	5%	T2,3	45%	T2,3	1%	T1
LV	7%	T2,3	1%	T2,3	----		92%	T1
LT	----		T1		----		IE	T1
LU	----		T1		----			
MT	----		T1		----			
NL	1%	T2,3	T1		0%	T2,3	98%	T2,3
PO	----		T1		32%	T1	68%	T1
PT	----		T1		100%	T2,3		
RO	5%	T1	T1		94%	T2,3	1%	T1
SK	----		T1		----			
SI	63%	T2,3	29%	T2,3	8%	T1		
ES	----		T1		----			
SE	25%	T2,3	28%	T2,3	21%	T2,3	26%	T1
IS	0,1%	T2,3	0,02%	T2,3	0,04%	T1	100%	T1
Average	32%		13%		44%		68%	

- Reported for 2020 as KC by more than half of the inventories
- Except DOM all the pools show high significance
- LB shows 1 non-compliance and 14 potentially non-compliance cases. The lack of estimates based on the absence of non-woody vegetation.
- DOM reported for 5 countries and appears with low significance.
- SOM_{min} shows 11 potentially non-compliance cases. When not reported the justification is often the lack of changes in the management across the years.
- SOC_{ORG} widely reported with Tier 1 method despite of the high significance of its emissions.

Wetland and Settlements “remaining”

- KC according the CRF table 7.
- (i) Non-compliance based on MS data.
- (ii) Assumed in balance under the Tier 1 methods.

MS	Living biomass		Dead organic matter		SOC mineral		SOC organic	
	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method
AT								
BE								
BG								
HR								
CY								
CZ								
DK							100%	T1
EE							100%	T2/3
FI	0,2%	T2/3					100%	T2/3
FR								
DE	0,1%	T2/3			0,004%	T2/3	100%	T2/3
GR								
HU	12%	T1			88%	T1		
IE	1%	T2/3					99%	T2/3
IT								
LV	30%	T2/3	11%	T2/3			60%	T1
LT							100%	T1
LU								
MT	30%	T1			38%	T1		
NL					100%	T2/3		
PO			74%	T2,3			26%	T1
PT								
RO	100%	T1						
SK								
SI								
ES							100%	T1
SE							100%	T1
IS							100%	T1

MS	Living biomass		Dead organic matter		SOC mineral		SOC organic	
	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method	Significance (%)	IPCC Method
AT	T1		T1		T1			
BE	T1		T1		T1			
BG	T1		T1		T1			
HR	T1		T1		T1			
CY	T1		T1		T1			
CZ	T1		T1		T1			
DK	T1		T1		T1			
EE	T1		T1		T1			
FI	T1		T1		T1			
FR	100%	T2/3	T1		T1			
DE	T1		T1		T1		100%	T2/3
GR	T1		T1		T1			
HU	T1		T1		T1			
IE	T1		T1		T1			
IT	T1		T1		T1			
LV	89%	T2/3	7%	T2/3	T1		3%	T1
LT	T1		T1		T1			
LU	T1		T1		T1			
MT	T1		T1		T1			
NL	T1		T1		T1		100%	T2/3
PO	82%	T2/3	T1		T1		18%	T2/3
PT	T1		T1		T1			
RO	T1		T1		T1			
SK	T1		T1		T1			
SI	100%	T2/3	T1		T1			
ES	T1		T1		T1			
SE	100%	T2/3	T1		T1			
IS	T1		T1		T1			

- For the year 2020 few MS reported these categories as Key.
- The widely use of Tier 1 methods, along with the lack of IPCC method for some categories, or the absence of “peat extraction areas” explain the lack of estimates for these categories.
- The reporting of **SOC_{ORG}** under WL raised 3 cases of non-compliance.

Some final remarks

- **Tier 1 methods** continue being widely use for reporting LULUCF. Consequently, the associated lack of estimates, or high uncertainty of the reporting, prevent a comprehensive view of carbon fluxes in this sector.
- A number of **MS would have to increase** the Tier method used for reporting LULUCF.
- Some **assumptions** used to justify the lack of estimates would need to be further scrutinized.
- The confidence in the estimates, and the comparability of the LULUCF sector would increase with the provision of transparent information on the level of **disaggregation** used in the background calculation.
- For most of the MS the CRF table only provide a net value of the fluxes that occur in certain pool and category, but it is not clear if different **strata** are used within the category to consider the variability of biomes within the land use category

Labelling the Tier methods for all the pools and categories

XXXX																										
From:	To:	FL					CL				GL				WL				SL				OL			
		LB	DW	LT	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg
FL		Tier 3	Tier 3	Tier 3	Tier 3	NO	Tier 3	Tier 3	Tier 3	NO	Tier 3	Tier 3	Tier 3	NO	Tier 3	Tier 3	NO	NO	Tier 3	Tier 3	Tier 3	NO	NO	NO	NO	NO
CL		Tier 3	Tier 3	Tier 3	Tier 3	NO	Tier 1	Tier 1	Tier 2	NO	Tier 1	NO	Tier 2	NO	Tier 1	NO	NO	NO	NO	NO	Tier 2	NO	NO	NO	NO	NO
GL		Tier 3	Tier 3	Tier 3	Tier 3	NO	Tier 1	NO	Tier 2	NO	Tier 1	Tier 1	Tier 2	NO	Tier 1	NO	NO	NO	NO	NO	Tier 2	NO	NO	NO	NO	NO
WL		Tier 3	Tier 3	Tier 3	NO	NO	Tier 1	NO	Tier 2	NO	Tier 1	NO	NO	NO	NO	NO	NO	NO	NO	NO	Tier 2	NO	NO	NO	NO	NO
SL		Tier 3	Tier 3	Tier 3	Tier 3	NO	NO	NO	Tier 2	NO	NO	NO	Tier 2	NO	NO	NO	NO	NO	Tier 1	Tier 1	Tier 1	NO	NO	NO	NO	NO
OL		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

XXXX																										
From:	To:	FL					CL				GL				WL				SL				OL			
		LB	DW	LT	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg	LB	DOM	SOCmin	SOCorg
FL		Tier 2	Tier 2	Tier 1	Tier 1	NO	Tier 2	Tier 2	Tier 2	NO	Tier 2	Tier 2	Tier 2	NO					Tier 2	Tier 2	Tier 2	NO	NO	NO	NO	NO
CL		Tier 2	Tier 2	Tier 2	Tier 2	NO	Tier 2	Tier 1	Tier 2	NO	Tier 2	NO	Tier 2	NO					NO	NO	Tier 2	NO	NO	NO	NO	NO
GL		Tier 2	Tier 2	Tier 2	Tier 2	NO	Tier 2	NO	Tier 2	NO	Tier 1	Tier 1	Tier 2	NO					NO	NO	Tier 2	NO	NO	NO	Tier 2	NO
WL		Tier 2	Tier 2	Tier 2	Tier 2	NO	NO	NO	NO	NO	NO	NO	NO	NO	Tier 1	NO	Tier 1	NO	Tier 1	NO	Tier 1	NO	NO	NO	NO	NO
SL		Tier 2	Tier 2	Tier 2	Tier 2	NO	NO	NO	NO	NO	Tier 1	NO	Tier 2	NO					Tier 1	Tier 1	Tier 1	NO	NO	NO	NO	NO
OL		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO					NO	NO	NO	NO	NO	NO	NO	NO

- ✓ The information in NIR is not always transparent for a unequivocally assignation of the methods under a single Tier. Further information in the NIR is needed to increase the confidence of the information included in the tables.
- ✓ Different categories are embedded under a “land converted” category. This hinders the assignation of a single Tier. e.g. a different Tier could be used for LB in FLcCL and GLcCL.

Thank you