

Synergies between the CAP new delivery model and LULUCF inventories



E. Lugato, P. Milenov, C. Puerta Pinero, V. Angileri, W. Devos





Removals and emissions of GHG REGULATION (EU) 2018/841

N	Total area of LU categories	Information on LU conversions	Geographically-explicit
	to information on LU conversions	but no location.	information on LU conversions
	Approach 1	Approach 2	Approach 3
	National statistics	Land Use Change matrix	Geo-tracked
Tier 1	National area statistics,	Annual (or annualised) LUC stats	Geo-Information, time series, defaul
IPCC default	combined with IPCC default	presented as national matrix –	values – weak, but better than App :
values	values – basic entry level	applied using default IPCC values	and 2
Tier 2 Country sp e cific values	National area statistics, combined with country-specific values – typical 1 st improvement	Annual LUC stats, combined with country-specific values	Geo-information, time series, country specific values – good coverage, detailed analysis
High res. data (e.g. model)	Not applicable	Modelied data combined with LUC matrix (not necessarily spatially dis-aggregated)	Geo-information at high-resolution, detailed time series, country-specific disaggregated data based on inventories and/or models

Challenges in the agricultural land

- high granularity (millions of parcels)
- Multitude of management– environmental interactions
- Soil-related emissions/ removal (beside livestock)
- Lack of high-resolution inventories and model frameworks for all CO₂, N₂O and CH₄?



Detecting changes in agricultural soils

CL remaining CL mineral soil ≈ 92% of area, 10% of CL soil emissions
CL remaining CL organic soil ≈ 2% of area, 60% of CL soil emissions
Land converted to CL ≈ 6% of area, 30% of CL soil emissions

(data from MS GHG inventories)

Small area with high uncertain emissions

Currently high area with <u>likely</u> small changes emissions/removals

but new expectation with the post-2020 CAP...



CAP new delivery model

Compliance





• Land Cover Classification (AL, PC, PG)

- Stable Ecological Focus Area/Landscape Features under GAEC
- RD agri-environment-climate measures

Check on spot on 5% sample

Performance



Check by Monitoring

- Crop recognition
- Activity detection (ploughing, mowing)
- GAEC and eco-schemes application (soil cover, grassland management, Landscape Features, EFA)

GTCAP support MS

Applicable to all parcels, all year



Synergies between CAP and LULUCF

GHG inventory community interoperabilit Tier 3 Geo-information at high-resolution, Modelled data combined with detailed time series, country-specific High res. data LUC matrix (not necessarily Not applicable disaggregated data based on spatially dis-aggregated) (e.g. model) inventories and/or models Tier 2 National area statistics, Geo-information, time series, combined with country-specific Annual LUC stats, combined with **Country specific** country specific values - good values - typical 1st country-specific values coverage, detailed analysis values improvement Tier 1 National area statistics, Annual (or annualised) LUC stats Geo-Information, time series, default **IPCC default** combined with IPCC default presented as national matrix values - weak, but better than App 1 values - basic entry level applied using default IPCC values and 2 values Approach 3 Approach 1 Approach 2 Land Use Change matrix National statistics Geo-tracked

Total area of LU categories Information on LU conversions No information on LU conversions

Improved Coverage and Representation

but no location.

Emissions/removals



Impact Indicator ?

CAP Performance

Semantic,

Geographically-explicit

information on LU conversions

Output and results indicators

CAP delivery model

Spatial explicit information agricultural managed areas



TIER 3 – Spatial explicit

T 1	IF CI	17
L	100/	10

EN

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 prioritised 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.

Member States are encouraged to apply <u>Tier 3 methodology, in accordance with the 2006 IPCC Guidelines for</u> National Greenhouse Gas Inventories.'.



Complexity of biogeochemical C and N cycles

- Non-linearity
- Variability in space and time
- Anthropogenic vs climate

JRC large-scale modelling

NUTS



Coupling model – spatially explicit activity data

LPIS-IACS

 stable land cover/annual land use



- Planting harvest date •
- Cover (residue • management, tillage)



ESDAC

Soil properties ٠

CbM potentially offers an automatic model implementation!!!

Bottom-

approach

up

Model input

1 Output interval
F Weather choice
legnaro.wth
1 129 LAST
1 130 HARV H
1 138 CULT T
1 140 CROP C4
1 140 PLTM
1 160 FERT (4.N)
1 275 LAST
1 276 HARV G90S
1 285 OMAD M2.LG
1 290 CULT K
1 295 CULT I
1 300 CROP RYE
1 300 PLTM
-999 -999 X
2 Block # @HHHH 1302
2000 Last year
1 Repeats # years
1991 Output starting year
12 Output month
1 Output intervall
C Weather choice
1 1 CROP G3FX
1 60 FRST
1 100 FERT (20.N)
1 140 HARV H
1 170 HARV H
1 200 HARV H
1 263 HARV H
1 304 LAST
1 305 SENM
1 310 EROD 0.2
-999 -999 X
4
European

Coupling model – spatially explicit activity data



Example of DayCent downscaling which may become an operative system but in the future...



Organic soils: a key "common" issue

EU emissions from organic soils

17 Mha -> 95 Mt CO₂

Land use		and use	Area	ICECF	Emissions from Org. Soils.	
	sub	ocategory	(Kha)	(tC/ha)	(Kt CO ₂)	
		4A1	12 264	[-2.60; 0.65]	13 631	
- LLA	N	4A2	407		1 494	
		4B1	1 242	[-10.01; -1.00]	25 813	
	AS	4B2	273		5 814	5%
		4C1	4 132	[-6.80; 0.25]	42 150	J 70
4	· · · · · · · · · · · · · · · · · · ·	4C2	354		5 683	
and the second						

Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020

Large uncertainty EF

 \mathbf{V}



Where\what wetlands\peatlands are...







Jones *et al.,* 2006 Based on EUSM (histosols) Tanneberger *et al.,* 2017 composite map of national datasets

SEPLA

Green Deal



2030 climate energy package

Climate law

The SEPLA project

"Ensure <u>comprehensive inventory of wetlands and peatlands</u> and address the <u>monitoring of their preservation and restoration</u> through the use of remote sensing and regularly updated geographically explicit datasets."





Interlink between mapping and processes





 Can we make a interoperable monitoring framework working for CAP and LULUCF?

• Potential to couple spatial data, EO and modelling

SEPLA can be a good "experiment" to link CAP and LULUCF community



Thank you





emanuele.lugato@ec.europa.eu

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