

Enhancing the user uptake of Land Cover / Land Use information derived
from the integration of Copernicus services and national databases
„InCoNaDa”

Potential of CLMS products for LULUCF sector

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Copernicus data in LULUCF

Possible use of Copernicus data

**CLMS in LULUCF reporting – HRL FTY accuracy
metrics**

Conclusions

Regulation (EU) 2018/841 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework**

***Rec. 32 To facilitate data collection and methodology improvement, land use should be inventoried and reported using geographical tracking of each land area, corresponding to national and Union data collection systems. The best use should be made of existing Union and Member State programmes and surveys including the Land Use/Cover Area frame Survey ('LUCAS'), the European Earth observation programme Copernicus and the European satellite navigation system Galileo for data collection.*

Regulation (EU) 1999/2018 on the Governance of the Energy Union and Climate Action up-to-date mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change**

** Part 3 of the Annex V to the Reg 2018/1999 [...Methodologies for monitoring and reporting in the LULUCF Sector: [Geographically explicit land-use conversion data in accordance with the 2006 IPCC Guidelines for national GHG inventories....]*

Spatial data (geographically explicit) in GHG inventory

Requirement level	2013-2020	2021 - onward
UNFCCC	Flexibility in applying any approach* available	Flexibility in applying any approach* available
EU	Flexibility in applying any approach* available	Formal requirement for approach* 3 application

* Approaches are provided in *Chapter 3 of the vol 4 of the IPCC 2006 Guidelines (Consistent Representation of Lands)*, singly or in combination, to estimate land areas for each land-use category relevant to the country.

GHGI ver. InCoNaDa ver. CLC+instance

IPCC category	National Land Identification System/ GHG inventory	CLMS	InCoNaDa	CLMS
4.A Forest land	forest land (1)	Limited use of CLC	forests; tress outside the forests; temporary unstocked area woody features >0.1ha (3)	TCD, SWF
4.B Cropland	arable land, orchards (2)	Limited use of CLC	annual cropland cropland with perennial vegetation set aside cropland with perennial vegetation (3)	TCD, SWF, GRA, IMD
4.C Grassland	permanent meadows and pastures; woody and bushy land (2)	Limited use of CLC	grassland with annual vegetation; grassland with perennial vegetation; other grassland with perennial vegetation cropped grassland with annual vegetation; other grassland with annual vegetation; tress outside the forests; woody features <0.1ha (10) *	TCD, SWF, GRA, IMD

GHGI ver. InCoNaDa ver. CLC+instance

IPCC category	National Land Identification System	CLMS	InCoNaDa	CLMS
4.D Wetland	land under waters (marine internal, surface stands); land under ponds; land under ditches; ecological arable land; wasteland (6)	Limited use of CLC	surface waters; on land water network; bulrush; swamps; other wetland (5)	national data
4.E Settlements	agricultural build-up areas; build-up and urbanized areas	Limited use of CLC	all greenery form in urban areas (20)	TCD, SWF, GRA, IMD
4.F Other land	miscellaneous land (1)	Limited use of CLC	scree, mound or rock debris; rocks; sandy or gravel ground; other unmanaged land; military training ground (7)	national data

GHGI ver. Inconada ver. CLC+instance

LU class	GHGI*	CLC+ Instance	kha to GHGI	% to GHGI	InCoNa Da	kha to GHGI	% to GHGI
	[kha]	[kha]	[kha]	[%]	[kha]	[kha]	[%]
SL	2286	1280	-1007	-44	1960	-323	-14
WL	1374	680	-693	-50	757	-616	-45
FL	9434	12536	3101	33	11742	2307	24
CL	13918	12136	-1782	-13	10304	-364	-26
GL	4441	2783	-1657	-37	6391	1949	44
OL	82	65	-17	-20	95	13	16

- Particular scope on protected areas - NATURA 2000 sites, National parks, nature reserves
- Remote sensing (RS) and NFI data confusion matrices (CF) for each similar units subject to protection and conservation measures
- RS data accuracy statistics (overall/OA, user/UA and producer accuracy/PA and commission error) for each land components subject to protection and conservation measures
- 45 973 reference points served in assesement

CLMS accuracy - metrics of HRL FTY

HRL FTY		Natura 2000	Breeding sites and resting places	The natural habitats sites	National parks	Nature reserves	Total
PL NFI (3rd cycle 2015-2019)	No. of NFI sample plots	20 439	11 637	8 802	503	788	45 973
	[%] of NFI sample plots	44.5%	25.3%	19.1%	1.1%	1.7%	100%
OA [%]		69.22	70.45		70.38	66.59	69.22

CLMS accuracy - metrics of HRL FTY

UA	HRL FTY (ID code)	Country level	Natura 2000	Nature reserves	National parks
		(%)			
	non-tree covered areas (0)	31.85	37.38	28.57	30.43
	deciduous (1)	70.14	71.32	77.01	67.63
	coniferous (2)	73.73	73.28	65.35	71.15

PA	HRL FTY code	Country level	Natura 2000	Nature reserves	National parks
		(%)			
	non-tree covered areas (0)	17.77	16.25	7.27	16.94
	deciduous (1)	69.35	71.76	76.72	69.85
	coniferous (2)	83.17	84.12	80.11	78.54

Getting close to the end – remaining elements:

- **scientific paper on HRL FTY accuracies in publishing**
- **2021 LCLU map**
- **2021 - 2018 map of LCLU changes**
- **possible comparability check with EEA data (prototype "LULUCF instance" for PL) –**

Concluding remarks

CLMS products provide complete and uniform coverage across Europe. However the results provided are not attainable by compiling national data.

Growing needs in LULUCF sector - both in terms of land use data assessment and changes in management. CLMS data may expand domestic statistics on land use and land management and its possible changes

Additional work to expand the InCoNaDa products with national data (such as eg. cadastral data) seems required to unify national statistics with CLMS data

Wetland and settlements with its complexity becoming a big challenge in terms of data preparatiuon applicable in LULUCF reporting (potential significant recalculation in future reporting in this area expected)

Thank you

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