From points and pixels to statistics – geospatial information for the EU SDG indicators

Session 2

Ekkehard PETRI – Eurostat, E.2
ekkehard.petri@ec.europa.eu

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Content of this presentation

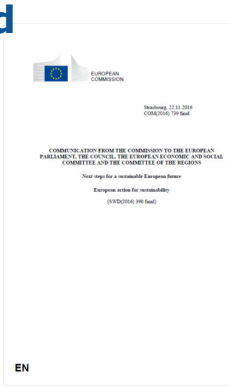
- *EU SDG indicator set*
- *Land use indicators*
- *Comparison of data sources and methods*
- *Conclusion*

EU SDG indicators

EU SDG monitoring: policy background

Commission Communication COM(2016) 739 on Next steps for a sustainable European future

«From 2017 onwards, the Commission will carry out more detailed regular monitoring of the Sustainable Development Goals in an EU context, ***developing a reference indicator framework for this purpose****»*


EUROPEAN COMMISSION

Strasbourg, 22.11.2016
COM(2016) 739 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Next steps for a sustainable European future

European action for sustainability

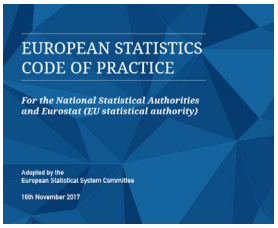
{SWD(2016) 390 final}

EN

EU SDG indicators - principles

*Selection criteria to maximise **relevance** and **statistical quality** of the indicator set:*

- *Strong links with Communication & long-term EU policies: Europe 2020, Circular Economy etc.*
- *Only **already available indicators**, meeting **minimum quality requirements***
- ***Limit of 100 indicators**, balanced between all 17 SDGs*



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Six quality criteria for individual indicators

1. Frequency of dissemination
2. Timeliness (=data freshness)
3. Geographical coverage
4. Comparability between countries
5. Length of time series (in years)
6. Comparability over time

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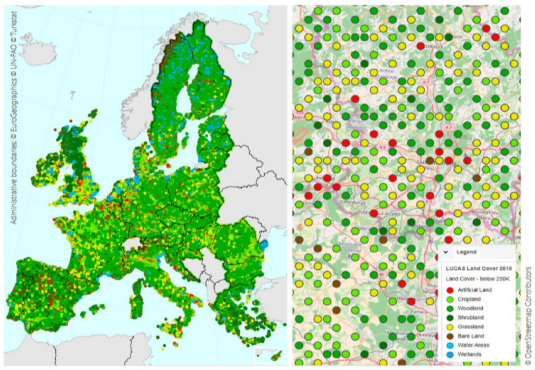
Land use indicators

Land use indicators for the EU for 2018

Global set (and national indicators)	EU set
11.7.1 | Average share of the built-up area of cities that is **open space** for public use for all, by sex, age and persons with disabilities	Share of urban population without **green urban areas** in their neighbourhood **(on-hold)**
11.3.1 | Ratio of land consumption rate to population growth rate	Artificial land cover per capita (in-situ) 
15.3.1 | Proportion of land that is degraded over total land area	
15.1.1 | Forest areas as proportion of total land area	Share of forest area (in-situ) 

Initial data source for EU land indicators – LUCAS points

- *Artificial land cover per capita*
- *Share of forest area*



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Current issues with Earth Observation data for EU SDG monitoring

1. Frequency of dissemination
2. Timeliness (=data freshness)
3. Geographical coverage
4. Comparability between countries
5. Length of time series (in years)
6. Comparability over time

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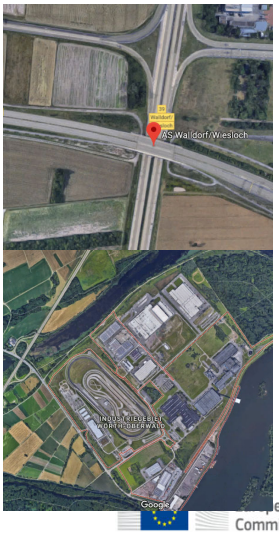
Advantages and disadvantages of the LUCAS sample survey

Advantages	Disadvantages
High data quality and known accuracy	Frequency of dissemination 3 years
Combined land use / land cover approach (flexibility)	Size of output areas
Timeliness t+1 year	
Comparability between surveys and countries	
Length of time series (since 2009)	

Conceptual issues

- *Artificial areas? → land cover approach*
- *Urban areas? → land use / functional aspects*



Large differences with similar concepts used in Earth Observation data

	EEA IMD 2012	LUCAS [lan_lcv_art]					
	Imperviousness 2012	**Artificial land**	**Built-up areas**				
	km²	km²	km²				
CNTR	*SSL*	*ART*	*BU*	SSL /land area	ART / land area	*ART / SSL*	*BU / SSL*
BE	2.319	3.709	1.820	7,6%	12,2%	*160%*	*78%*

For 2019 monitoring – broaden the concept to land degradation

*'Land degradation is a **complex phenomenon that is linked to the long-term, biological productivity** of land. It brings together several elements, including **soil degradation and the capacity of land areas to support water resources, biodiversity and primary productivity**.*

*Soil degradation, in turn, encompasses erosion, the richness of soil organic matter and also soil sealing. **Soil sealing** is itself closely related to **land take**, and refers specifically to the covering of the soil surface with materials like concrete and stone, as a result of new buildings, roads, parking places but also other public and private space.'*

Land use indicators for the EU for 2019

Global set (and national indicators)	EU set
11.7.1 | Average share of the built-up area of cities that is **open space** for public use for all, by sex, age and persons with disabilities	Share of urban population without **green urban areas** in their neighbourhood **(on-hold)**
11.3.1 | Ratio of land consumption rate to population growth rate	~~Artificial land cover per capita (in-situ)~~ 
15.3.1 | Proportion of land that is degraded over total land area	
15.1.1 | Forest areas as proportion of total land area	Share of forest area (in-situ)

Land use indicators for the EU for 2019

Global set (and national indicators)	EU set
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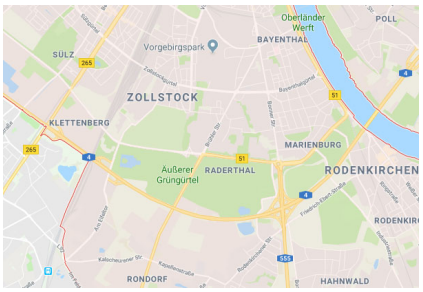
11.3.1 | Ratio of land consumption rate to population growth rate	Settlement area per capita (in-situ) 
Indicator 15.3.1 | Proportion of land that is degraded over total land area	~~Artificial land cover per capita (in-situ)~~
	Imperviousness change rate (Earth Observation) 
15.1.1 | Forest areas as proportion of total land area	Share of forest area (in-situ)

New indicator - settlement area per capita

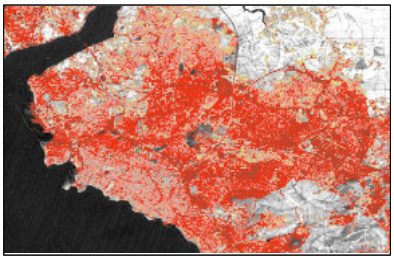
- *Describes all land take for buildings, industrial and commercial areas, infrastructure, sport grounds etc. and includes both sealed and non-sealed surfaces.*
- *Possible thanks the combined land use/land cover approach of LUCAS*



Land cover indicator - pixels

New indicator on soil sealing using Copernicus data

- *Describes increase in sealed soil surfaces with impervious materials due to urban development and construction*
- *Describes land cover only but with high level of detail*
- *Developed from Copernicus High Resolution Layers*



Advantages and disadvantages of Earth Observation data

Advantages	Disadvantages
High data quality	Often unknown statistical quality (CoV)
Full coverage, high resolution (20m)	Land cover only
Change detection	
Length of time series (2006-2015)	
Comparability between countries	

From pixels to statistics

- *Direct estimation from classified images (pixel counting) has a strong risk of bias*
- *The bias is ≈ commission error – omission error (commission – wrongly classified as sealed, omission – wrongly classified as not sealed but omission ≠ commission)*
- *Quality of sampling of validation points affects quality of bias estimate/ correction*
- *Current Earth observation products often do not provide error estimates for area statistics*

Conclusion

Comparison

Earth Observation	In-situ
Full coverage, high resolution	Known statistical quality
Change detection	Comparability over time
Comparability between countries	
Hot spot identification	Rich set of categories and (sub-) classes (76)
(More timely and frequent outputs)	
Land cover only	Land cover and land use

Relevant methodological work

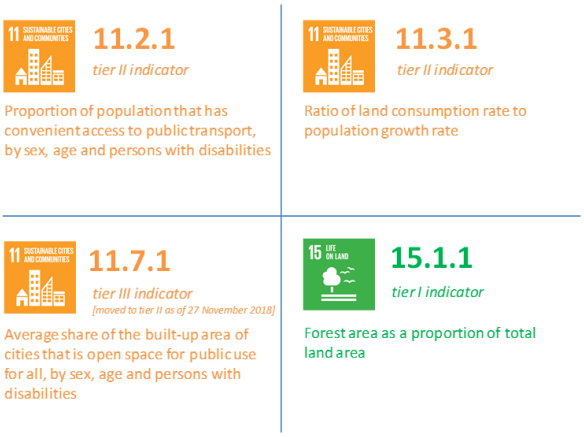
GEOSTAT 3 – A statistical geospatial framework for Europe

"Develop a European guide for implementation of the Global Statistical Geospatial Framework (GSGF). Covering the key aspects of statistical-geospatial integration as set out in the global framework"

www.efgs.info/geostat/geostat-3/

Top-candidates in Europe

Indicator relevant and improvements interesting for national reporting and EU indicator set?



References

- *GEOSTAT projects* *https://www.efgs.info/information-base/case-study/sdg-indicators/*
- *IAEG-SDG Work Group Geospatial Information* *http://ggim.un.org/UNGGIM-wg6/*
- *UN-GGIM: Europe work group on data integration* *http://www.un-ggim-europe.org/content/wg-b-data-integration*

THANK YOU FOR YOUR ATTENTION

Eurostat's EU SDG dedicated website:
http://ec.europa.eu/eurostat/web/sdi/overview