Land use in transition and resulting policies
Landcover change in Europe

Current EEA landcover/landuse products

„Case study“ Urban Sprawl

Direct and indirect impacts on EU policies on land
Landcover change in Europe
Approaching the land system in Europe

**Impacts**
Degradation of ecosystems and services, costs, etc.

**State**
Land multifunctionality

**Pressures**
Changes in land use and management

**Driving forces**
Environmental and socio-economic processes

**Responses**
Governance, planning, land recycling, etc.

Supply

Demand
Drivers and causes of land take and land degradation

- demand for settlements, commerce, industry and infrastructure;
- food demand;
- demand for bioenergy, including wood- and crop-derived bioenergy;
- demand for other crop-derived products and other wood products.
Artificial land cover expansion 2006-2012
Drivers of change 2006-2012

Drivers of change
Dominant Land Cover Flow:
- Icf1 Urban land management
- Icf2 Urban residential sprawl
- Icf3 Sprawl of economic sites and infrastructures
- Icf4 Agriculture internal conversions
- Icf5 Conversion from forested & natural land to agriculture
- Icf6 Withdrawal of farming
- Icf7 Forests creation and management (except Icf74)
- Icf8 Water bodies creation and management
- Icf9 Changes of land cover due to natural and multiple causes
Annual average trend in artificial areas, per period

Artificial areas

<table>
<thead>
<tr>
<th>Year Period</th>
<th>Artificial Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2000</td>
<td>1050</td>
</tr>
<tr>
<td>2000-2006</td>
<td>950</td>
</tr>
<tr>
<td>2006-2012</td>
<td>900</td>
</tr>
</tbody>
</table>
Example: Important loss of high-nature value farmland (based on land cover flows)
Example: Increasing landscape fragmentation

![Map showing landscape fragmentation in Europe with various colors representing different levels of fragmentation.](image-url)

- **Landscape fragmentation per 1 km² grid (2009)**
  - Number of meshes per 1 000 km² ($s_{eff}$)
  - < 0.10
  - 0.10–0.25
  - 0.25–0.50
  - 0.50–1.00
  - 1.00–5.00
  - 5.00–10.00
  - 10.00–25.00
  - 25.00–50.00
  - 50.00–100.00
  - > 100.00

- **Legend**
  - Mountain ridges
  - Outside data coverage

[Source: European Environment Agency]
Current EEA landcover/landuse products
Copernicus land monitoring service
pan-European, local & RDA products

Corine Land Cover 2012

Imperviousness

Tree cover density

Urban Atlas

Riparian Zones

Natura2000

EU-DEM

EU-hydro

Image mosaics

IMD Time Series

Forest type

(Semi-) natural Grassland

Wetlands

Water bodies
pan-European component –
High Resolution Layers (HRL’s)

**Imperviousness**
- Degree of Imperviousness 2012 (20 m and 100 m)
- Impervious density change 2009-2012 (100 m)

**Forest**
- Tree cover density (20 m and 100 m)
- Forest Type (20 m and 100 m)

**Natural and semi-natural grassland**
- Natural and semi-natural grassland (20 m and 100 m)

**Wetlands**
- Wetland (20 m and 100 m)

**Water bodies**
- Permanent water bodies (20 m and 100 m)

+ wetlands and water bodies
Image data (region of Pamplona, Spain)
Urban Atlas (region of Pamplona, Spain)
Riparian zones (region of Pamplona, Spain)
Natura 2000 (region of Pamplona, Spain)
UA + RZ + N2K (region of Pamplona, Spain)
„Case study“ Urban Sprawl
“Case study” Urban Sprawl

Drivers:
Socio-economic and demographic factors
“Case study” Urban Sprawl

Results:

WUP (weighted urban Proliferation) method confirmed useful

Comparable measurements across Europe available

Call for policy actions
The direct and indirect impact of EU policies on land
Links between land take, land degradation and land efficiency

**Changes in land use**
- Land take (urban sprawl, infrastructures)
- Intensification (agriculture, forestry)
- Abandonment

**Land degradation**
- Soil degradation
  - Sealing/compaction
  - Erosion
  - Organic matter
- Water resources
- Biodiversity
- Primary productivity
- Socio-economic dimension of land degradation

**Land efficiency**
- Changes in efficiency of individual functions (mainly linked to provisioning and urban/infrastructure)
- Impacts on other functions (mainly linked with natural capital)
- Gap function delivery vs suitability
EU policies influencing land use: a schematic view
A ‘system’ of EU policies affects land use in a territory

Note: the figure presents selected EU policy areas, and is not intended to be comprehensive.
Key EU policies on land

EU’s main investment policy on land
- Cohesion Policy

**EU POLICY AREA**

- Infrastructure investments (transport, energy, ICT)
- Regeneration of brownfield sites
- Investments in green infrastructure
- Investments in biodiversity, nature protection and ecosystems promotion
- Investments in sustainable multi-modal urban mobility

**RESULTS**

**POTENTIAL IMPACTS ON LAND/SOIL**

- Land take
- Land fragmentation
- Soil sealing
- Urban sprawl (transport infrastructure)
- Change in transport mix (intermodality)
- Land recovery / rehabilitation
- Soil decontamination
- Reduction of land fragmentation
- Recovery of degraded land
- Protection and restoration of soil
- Reduced land take and land degradation
- Compact urban development

Source: EEA/Milieu elaboration.
Key EU policies on land

Impact of EU economic sectors on land

• Transport Policy

• Energy and Climate Policy

- Energy infrastructure investments
- Increased use of renewable energies and biofuels
- Land take
- Land fragmentation
- Soil sealing
- Integrated infrastructure networks
- Land use changes
- Land take
- Agricultural intensification leading to loss of soil organic matter and reduction in soil water retention
- Mitigation of soil erosion
Key EU policies on land

Impact of EU economic sectors on land

- Common Agricultural Policy*

* Status 2016 policy under discussion
Key EU policies on land

EU environmental policy on land
- Nature and biodiversity protection
Key EU policies on land

EU environmental policy on land

- Water management

EU Policy Area

- Nitrates Directive
- Codes of good agricultural practice
- Other measures

Water Framework Directive

- RBMPs/PoMs

Floods Directive

- FRMPs and their measures

Blueprint for Europe's waters

- Implementation via other EU policies

Results

Potential Impacts on Land/Soil

- Reducing fertilizer use
- Manure management
- Buffer strips and other measures to reduce runoff
- Measures to restore rivers and ecosystems
- Measures to reduce pressures from agriculture
- Other measures, e.g. for navigation
- Sustainable land use (including flood plain restoration)
- Other measures
- Promotion of green infrastructure
- More efficient water use in agriculture, other sectors
“Case study” Urban Sprawl

Drivers:

Socio-economic and demographic factors
“Case study” Urban Sprawl

Results:

WUP (weighted urban Proliferation) method confirmed useful

Comparable measurements across Europe available

Call for policy actions
Summary – recent EEA reports on the matter

Landscapes in transition 10/2017 – for framing

The direct and indirect impacts of EU policies on land 8/2016
- for addressing drivers of land use change

Land recycling in Europe 31/2016 – example of responses

- Extensive study of a particular issue with scientific added value
Thank You and Enjoy Tirana!

Delineation of Riparian Zones 2012

Thanks to andrus.meiner@eea.europa.eu for supporting references

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