EU ecosystem accounting
The ‘INCA KIP’: Knowledge Innovation Project for an Integrated system for Natural Capital and ecosystem services Accounting

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(Environmental statistics and accounts; Sustainable development)

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Policy context for natural capital accounting in the EU

- EU Biodiversity Strategy to 2020:
  - Action 5: map and assess the state of ecosystems and their services, assess their economic value and promote the integration of these values into accounting and reporting systems

- EU 7th Environmental Action Programme (7th EAP):
  - Objective 1: 'protect, conserve and enhance the European Union’s natural capital'
  - Objective 5: build environmental knowledge base
What do we need for ecosystem accounting in the EU?

- We need biophysical accounts
  - for direct use
  - as a basis for valuation studies, upscaling
- We need an EU data layer of accounts
  - reference frame for countries
  - data foundation for responding to EU policies
- We need stepwise approach towards a common methodology
What is the challenge?

Many different & separate & expensive data collection exercises which are not tailored to mapping and assessing ecosystems and which are undertaken by different institutions.

- LUCAS (ground observation)
- Biodiversity monitoring
- COPERNICUS (satellite images)
- Farm Land Cover
- Forest statistics
- Water Framework Directive reporting
- Natura 2000 reporting
- ...
What is the potential solution?

- A system of nested and datasets within a common framework;
- Integration of existing initiatives – assessment of ecosystems, modelling ecosystem services...;
- Use of models to transfer data into accounts and fill data gaps.
Project KIP INCA

- Knowledge Innovation Project on Integrated System for Natural Capital and Ecosystem Services Accounting in the EU
- Project developed by a partnership of European Commission services (DG ENV, DG CLIMA, DG JRC, DG ESTAT, DG RTD and EEA)
- Objective to strengthen the knowledge base for the implementation of the 7th EAP
- Knowledge Innovation Projects (KIPs) have the ambition to address gaps in environmental knowledge, using an innovate approach
**Eurostat (leader in phase 1):**
- Experience with geospatial-statistical data integration
- Operates LUCAS
- Lead service for geospatial information in the EU
- Statistics on land use/land cover, forest, agriculture
- Environmental-Economic Accounts (SEEA)

**EEA:**
- Principal information provider on the state of the environment in Europe
- Long-term experience in ecosystem accounting, involved in MAES
- Operates data centres on water and biodiversity
- Responsible for CORINE land cover and Copernicus data
- The main data processing partner

**DG Environment:**
- Provides policy context and is the principal user of KIP INCA outputs
- Responsible for MAES
- Follows Natural Capital Accounting initiatives (private and global)
- "owns" administrative reporting obligations

**EC Joint Research Centre:**
- Operates data centres on forest and soil and information systems on agriculture, ecosystems and water
- Vast modelling experience on ecosystem services

**DG RTD:**
- Runs research programs on ecosystem services and biodiversity, e.g. ESMERALDA
- Coordination between INCA and research activities
Where does KIP INCA fit in?

- KIP INCA provides a shared data platform to record the extent, condition and trends in ecosystems and their services.
- KIP INCA uses a fit-for-purpose approach based on existing, EU-wide data collections (LUCAS, Copernicus, MAES, administrative data, etc.)
- KIP INCA integrates all available data and makes sure new data fit into the system (→ permanent improvement).
- KIP INCA accounts follow UN accounting standards (SEEA and SNA)
- KIP INCA tests SEEA–EEA (but is not limited to SEEA–EEA = innovation)
- EU Member States can link their national systems to KIP INCA.
KIP INCA structure and timeline

Two phases:

- **Phase 1: Feasibility and design phase (mid 2015 – mid 2016)**
- **Mid 2016: go/no go decision by Directors General**
- **Phase 2: Implementation phase (2016 – 2020)**
Expected outcomes of KIP INCA, Phase 1

- A **blueprint for the future INCA** including the sets of tables and accounts, the input data layers, some mock-up accounts for illustration and a description of the limitations
- A **dialogue with stakeholders** (EU member states, researchers, policy makers, other users) e.g. at the MAES delivery workshop in December 2015
- A **reliable estimate of necessary resources**
- An **implementation plan until 2020**
- A **plan for improving the data sources**
KIP INCA timeline – 'to do list' for Phase 1

**Data:**
- Review existing and planned EU-wide data collections
- Test the integration of these data sources
- Propose changes to existing data collections and models
- Define minimum data quality standards

**System design:**
- Test modelling approaches
- Understanding the uncertainties including error propagation, reducing complexity
- Design a prototype system of (physical) ecosystem accounts in line with UN standards

**Further proposal:**
- Design a plan for an integrated accounting system, to be presented to the EKC for approval (for Phase 2)

**Resources:**
- Secure necessary resources from all stakeholders
Components of KIP INCA now being developed

(Source: SEEA – EEA)
Existing potential input layers: MAES activities
(ecosystem extent)

<table>
<thead>
<tr>
<th>Ecosystem type</th>
<th>EUNIS Level 1</th>
<th>EUNIS Level 2</th>
<th>Total ecosystem coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1 Buildings of cities, towns and villages</td>
<td>102151</td>
<td>46.08</td>
<td></td>
</tr>
<tr>
<td>J2 Low density buildings</td>
<td>94150</td>
<td>42.47</td>
<td></td>
</tr>
<tr>
<td>J3 Extractive industrial sites</td>
<td>6433</td>
<td>2.91</td>
<td></td>
</tr>
<tr>
<td>J4 Transport networks and other constructed hard-surface areas</td>
<td>16100</td>
<td>7.26</td>
<td></td>
</tr>
<tr>
<td>J5 Highly artificial man-made waters and associated structures</td>
<td>1828</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>J6 Waste deposits</td>
<td>998</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Cropland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I1 Regularly or recently cultivated agricultural, horticultural and domestic habitats</td>
<td>1243168</td>
<td>99.18</td>
<td></td>
</tr>
<tr>
<td>I2 Cultivated areas of gardens and parks</td>
<td>1092</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>Grassland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1 Dry grasslands</td>
<td>9330</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td>E2 Mesic grasslands</td>
<td>571931</td>
<td>82.48</td>
<td></td>
</tr>
<tr>
<td>E3 Seasonally wet and wet grasslands</td>
<td>55771</td>
<td>8.04</td>
<td></td>
</tr>
<tr>
<td>E4 Alpine and subalpine grasslands</td>
<td>21128</td>
<td>3.05</td>
<td></td>
</tr>
<tr>
<td>E5 Woodland fringes, clearings and fall forbs stands</td>
<td>0</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>E6 Inland salt steppes</td>
<td>3043</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>E7 Sparsely wooded grasslands</td>
<td>32195</td>
<td>4.64</td>
<td></td>
</tr>
<tr>
<td>Woodland and forest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1 Broadleaved deciduous woodland</td>
<td>489790</td>
<td>28.29</td>
<td></td>
</tr>
<tr>
<td>G2 Broadleaved boreal woodfiond woodland</td>
<td>40248</td>
<td>2.26</td>
<td></td>
</tr>
<tr>
<td>G3 Coniferous woodland</td>
<td>695907</td>
<td>40.35</td>
<td></td>
</tr>
<tr>
<td>G4 Mixed woodland</td>
<td>291687</td>
<td>16.91</td>
<td></td>
</tr>
<tr>
<td>G5 Lines of trees, small woodlands, recently felled woodlands, early stage woodland, shrubs</td>
<td>199784</td>
<td>11.58</td>
<td></td>
</tr>
<tr>
<td>Heathland and shrub</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1 Tundra</td>
<td>0</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>F2 Arctic, alpine and subalpine shrub</td>
<td>34624</td>
<td>14.88</td>
<td></td>
</tr>
<tr>
<td>F3 Mediterranean-montane scrub</td>
<td>52824</td>
<td>22.76</td>
<td></td>
</tr>
<tr>
<td>F4 Temperate shrub heathland</td>
<td>691</td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>

(Source: EEA)
Existing potential input layers - MAES activities (ecosystem services)
From maps to accounting tables...
(...from accounting tables to better policies)

Table 4.2 Ecosystem extent account

<table>
<thead>
<tr>
<th>Ecosystem type</th>
<th>Ecosystem extent</th>
<th>Ecosystem condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (ha)</td>
<td>Vegetation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hectares</td>
</tr>
</tbody>
</table>

Table 4.4 Ecosystem services supply account (LCEU by CICES)

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Units</th>
<th>Land cover type</th>
<th>Provisioning</th>
<th>Regulation</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban</td>
<td>Pasture</td>
<td>Cropland</td>
<td>Forest</td>
</tr>
<tr>
<td>Hunting</td>
<td>kg meat</td>
<td>4,071</td>
<td>11,100</td>
<td>14,732</td>
<td>8,100</td>
</tr>
<tr>
<td>Drinking water extraction</td>
<td>10³ m³ water</td>
<td>7,026</td>
<td>11,277</td>
<td>3,117</td>
<td>214</td>
</tr>
<tr>
<td>Crop production</td>
<td>10³ kg produce</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fodder production</td>
<td>10³ kg dry matter</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Air quality regulation</td>
<td>10³ kg PM₁₀</td>
<td>272</td>
<td>404</td>
<td>717</td>
<td>700</td>
</tr>
<tr>
<td>Carbon sequestration</td>
<td>10³ kg carbon</td>
<td>875</td>
<td>8,019</td>
<td>275</td>
<td>50,664</td>
</tr>
<tr>
<td>Recreational cycling</td>
<td>10³ trips</td>
<td>2,690</td>
<td>1,863</td>
<td>2,611</td>
<td>1,565</td>
</tr>
</tbody>
</table>
Summary on KIP INCA

- **Data integration** allows making use of existing data
- Expertise and data available with **key partners**, incl. accounting, monitoring, analysis and modelling
- **Gradual adjustment** of existing data collections (such as LUCAS 2018) towards better contributing to ecosystem accounting
- **EU level** data sets are integrated by **EU-level bodies** — no extra work for EU member states but an opportunity to "plug in"
- KIP INCA is the EU response to clear **EU policy targets of the 7th EAP** and current international developments