Natural Capital Accounting in support of land degradation neutrality

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Overview

• What is NCA and the SEEA
• Experiences from EU
• Link with UNCCD Assessments / LDN
• NCAVES project
  > Mexico
• Conclusions
WHAT IS NATURAL CAPITAL ACCOUNTING AND THE SEEA
Limitations of Traditional Accounts

National accounts do not cost depletion or degradation.

Narrow view of environment -> only asset when owned and yielding benefits

Do not capture all economic contributions of nature (e.g. regulating services)

-> Decision makers don’t have key information necessary to effectively pursue and track sustainable development.

-> Need for SEEA / NCA!
System of Environmental-Economic Accounting (SEEA)

When doing NCA, applying SEEA as measurement framework

- Work started in late 1980s
- Rio 1992 / Agenda 21 -> recognized the need for satellite accounts
- The SEEA Central Framework was adopted as an international statistical standard by the UN Statistical Commission in 2012
- The SEEA Experimental Ecosystem Accounting complements the Central Framework and represents international efforts toward coherent ecosystem accounting
## SEEA accounts

| SEEA-CF (Central Framework) | • Assets  
• Physical flows  
• Monetary flows | • Minerals & Energy, Land, Timber, Soil, Water, Aquatic, Other Biological  
• Materials, Energy, Water, Emissions, Effluents, Wastes  
• Protection expenditures, taxes & subsidies |
|-----------------------------|--------------------------------------------------|
| SEEA Water; SEEA Energy; SEEA Agriculture, Forestry and Fisheries | Add sector detail | As above for  
• Water  
• Energy  
• Agricultural, Forestry and Fisheries |
| SEEA-EEA (Experimental Ecosystem Accounting) | Adds spatial detail and ecosystem perspective | Extent, Condition, Ecosystem Services, Thematic: Carbon, Water, Biodiversity |
From data silos to integrated information

INDICATORS

ACCOUNTS
SNA | SEEA

BASIC DATA
Economic | Social | Environmental
Why use an accounting framework for the environment?

• Presents environmental and economic information together in a consistent way

• Allows for environmental data to be integrated with existing System of National Accounts measures

• Provides:
  o International comparability
  o Broad credibility
  o Replicability

• *Transforms data into information*
80 countries and counting

SEEA Around the World
EXAMPLES
ECOSYSTEM ACCOUNTING IN EU
Ecosystem extent account - EU

EEA: Net changes in ecosystem extent inside and outside of Natura 2000 (=protected) areas, 2000-2012

- RESULTS –

Ecosystem condition account - EU
Assessing ES
Crop pollination

Pollination potential

Pollination demand
Crop pollination

Use area (overlap)

Benefit: yield attributable to wild insect pollinators
Crop pollination

Useful for the integrated narratives

IPBES: “decline of wild pollinators in North West Europe”
Supply table for the EU ecosystem services in 2012, million EUR

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Urban</th>
<th>Cropland</th>
<th>Grassland</th>
<th>Heathland and shrub</th>
<th>Woodland and forest</th>
<th>Sparsely vegetated land</th>
<th>Wetlands</th>
<th>Rivers and lakes</th>
<th>Coastal and intertidal areas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20,560</td>
</tr>
<tr>
<td>Timber provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14,540</td>
</tr>
<tr>
<td>Global climate regulation</td>
<td>20</td>
<td>150</td>
<td>850</td>
<td>20</td>
<td>13,330</td>
<td>20</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
<td>14,390</td>
</tr>
<tr>
<td>Flood control</td>
<td>90</td>
<td>1,020</td>
<td>3,130</td>
<td>360</td>
<td>11,390</td>
<td>0</td>
<td>330</td>
<td>NA</td>
<td>NA</td>
<td>16,320</td>
</tr>
<tr>
<td>Crop pollination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9,720</td>
</tr>
<tr>
<td>Nature-based recreation</td>
<td>80</td>
<td>4,070</td>
<td>7,480</td>
<td>3,100</td>
<td>30,720</td>
<td>1,350</td>
<td>2,300</td>
<td>1,020</td>
<td>280</td>
<td>50,400</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>35,520</td>
<td>11,460</td>
<td>3,480</td>
<td>69,980</td>
<td>1,370</td>
<td>2,630</td>
<td>1,020</td>
<td>280</td>
<td>125,930</td>
</tr>
</tbody>
</table>

| Value in EUR/km²                   | 880   | 22,090   | 22,610    | 19,250             | 44,010             | 23,410                 | 26,890   | 9,320          | 14,530                      | 28,740|

Total for Year 2012: 125,930 million EUR

NA: not assessed

Values rounded to the nearest tens

56,370 euro/km² of green urban area
Trends for ecosystem services

- Crop provision (26%)
- Crop pollination (3%)
- Flood control (2%)
- Timber provision (0%)
- Global climate regulation (1%)
- Nature-based recreation (11%)

Million euro

- 2000
- 2006
- 2012

European Commission
NATURAL CAPITAL ACCOUNTING AND LAND DEGRADATION NEUTRALITY
Complementary frameworks

- LDN provides policy context
- Response hierarchy

Conceptual framework

- land as natural capital that provides ecosystem services; stocks and flows
- Scope
  - affected areas (+ conservation areas)
- Spatially explicit land units
- LDN balance sheet

Help with resilience + degradation assessment

Accounts used to underpin indicators

Assess trade-offs ("like for like") + scenario analysis

SEEA more detail on individual ES and on land units

Links to the economy (pressures)
External Drivers / Pressures

Natural
- Climate change
- Natural disasters / extreme events

Exacerbated by
- Geology / geomorphology
- Topography
- Soil properties
- Biodiversity

Anthropogenic
- Population change
- Migration impacts

Policy impacts
- Globalization impacts
- Market price shocks
- Instability insecurity conflict
- Negative land use change
- Unsustainable farming practices
- Unsustainable forestry practices
- Unsustainable mining practices
- Infrastructure design
  - Ineffective governance
  - Land tenure insecurity
  - Poor land use planning
  - Inappropriate technology
  - Waste, pollution

Land Degradation

Degradation Processes
- Landscape modification
- Soil erosion by water and wind
- Soil surface sealing, compaction
- Soil salinisation & alkalisation
- Soil acidification
- Soil fertility decline
- Soil contamination
- Soil extraction
- Aridification
- Decline in vegetation cover
- Decline in vegetation community functioning
- Decline in biomass
- Decline in biodiversity
- Depletion of seed bank
- Increase in weeds
- Increase in invasive species
- Habitat loss
- Hydrological modification
- Change in groundwater level / quality

Inherent Properties
- Slope
- Orientation
- Soil depth
- Soil texture
- Clay types
- Stoniness
- Soil strength and structure (subsoil)
- Parent material
- Biodiversity

Manageable Properties
- Nutrient levels
- Soil organic matter
- Temperature
- Soil pH
- Macroporosity
- Bulk density
- Soil strength and structure (top soil)
- Size of aggregate (topsoil)
- Sedimentation
- Land cover
- Vegetation community structure
- Water table

Biodiversity
- Biodiversity conservation
- Soil biodiversity
- Agrobiodiversity

Ecosystem Services

Cultural Services
- Cultural heritage
- Recreation & tourism

Regulating Services
- Regional climate regulation
- Climate change mitigation
- Disaster risk reduction (flood, drought, soil erosion)
- Regulation of pests and diseases
- Pollination
- Water regulation

Provisioning Services
- Food
- Water
- Fibre, wood products
- Medicinal resources

Supporting Services
- Primary production
- Nutrient cycling
- Water cycling
- Soil formation

Human Needs

Self-actualisation needs
Esteem needs (psychological)
Social needs
Safety & security needs
Physiological needs
SEEA accounts and UNCCD assessments

- Land account:
  - Land cover / land use SO1-1 SDG 15.3
- Ecosystem condition account
  - SOC (condition account) SO1-3 SDG 15.3
- Carbon account:
  - NPP SO1-2 SDG 15.3
  - Above ground carbon SO4-1
- Ecosystem services supply and use account
  - Additional indicators (individual ES)
- Biodiversity (species) account SO4-2
- Integrated presentations
  - Socio-economic information SO2
- Envir. Protection expenditure accounts SO5-1-4
NATURAL CAPITAL ACCOUNTING AND VALUATION OF ECOSYSTEM SERVICES PROJECT (NCAVES)
Overall objectives

- Advance the knowledge agenda on Natural Capital Accounting, in particular ecosystem accounting
- By initiating pilot testing of SEEA Experimental Ecosystem Accounting, with a view to:
  - Improving the measurement of natural biotic resources, ecosystems and their services at the (sub)national level
  - Mainstreaming biodiversity and ecosystems in (sub)national level policy-planning and implementation
  - Contributing to the development of internationally agreed methodology and its use in partner countries.
NCAVES

- Implementing partners
  - United Nations Statistics Division
  - United Nations Environment Programme
  - SCBD
- Sponsor
  - European Union
  - Partnership Instrument
- Five partner countries
  - Brazil, China, India, Mexico, South Africa
- Project duration
  - 4 years from 2017-2020
Example from Mexico

Applying the S-world model (Wageningen University)
Tier 2 estimates (using national data sources)

New data from Inegi
- Soil profile database (4400 profiles)
- 1:250,000 soil map

Same data on Rainfall, Temperature, Topography, Land Cover, and Vegetative cover.

OC (0-30) OC (30-100) Soil depth
Clay content
Accounts tier 1 and tier 2

Three indicators:
- C-stock (kg/ha)
- Soil fertility (-)
- Water holding capacity in mm.

Soil fertility indicator:
1. Expert inventory (12 persons, 5 variables)
2. Relative importance of each factor by experts for agreed list
3. Calculate indicator as:
   \[ I_{fert} = \sum_{i=1}^{5} C_i \frac{(v_i - v_{min})}{(v_{max} - v_{min})} \]
Conclusions

• NCA and UNCCD assessments have a lot in common
• Further coordination and collaboration is important
  > National statistical system (SEEA) with
  > Relevant line ministries and
  > Technical agencies
• SEEA Revision Process provides important opportunities
• Objective is to have a agreed international framework by 2020
Revision of the SEEA EEA

• Elevation to an agreed methodological document
• Engagement with various stakeholders
  > Science community
  > Environmental economics
  > Geospatial community
  > National Accounts
• Timeline by end of 2020 – endorsement by UN Statistical Commission by March 2021
• Process aligned with the Post-2020 biodiversity framework, review of SDG and Climate change process
• Seek for broad involvement of partners and experts in the process
  > CBD, IPBES, UNFCCC, UNCCD, EU, Academia, etc…
THANK YOU
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