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Turning data into insights

19–21 February 2019 | Munich, Alte Kongresshalle, Germany

TOWARDS ECOLOGICAL STEWARDSHIP BASED ON SPATIALLY EXPLICIT ECOSYSTEM ACCOUNTS

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Why Accounting for Ecosystems? To Measure Capital Degradation (or Recovery)

Ecosystem degradation impacts

- Natural resource loss
- Biodiversity loss
- Desertification
- Water disturbance, droughts, floods
- Climate change and adaptation issues
- Exposure to natural risks
- Un-sustainability of ecosystem services…

and associated socio-economic issues

- Little economy's liability to its impacts on ecosystems

= No ecosystem capital depreciation

= Unpaid monetary costs (Avoidance, Restoration, Offset…)

= Ecological debts and related financial risks

= Food (in)security

= Health issues (clean water, clean urban air…)

= Un-sustainable economic growth

Ecosystem capital degradation

= Loss of ecosystem capability to supply services and sustain life on Earth

= Loss of intrinsic ecological value

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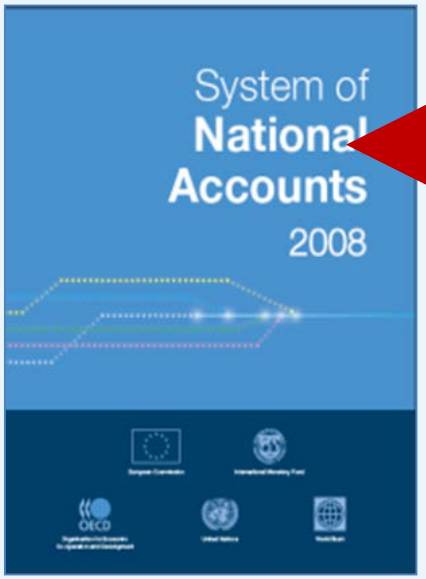
Ecosystem Accounting in the International Statistical Context

The System of Environmental-Economic Accounts "Central Framework" (SEEA-CF) adopted by the UN Statistical Commission in 2012 as an international statistical standard on par with the System of National Accounts (SNA 2008) has been supplemented in 2013 by a volume on "Experimental Ecosystem Accounting" (SEEA-EEA). While the SEEA-CF is recommended for implementation, the SEEA-EEA which is a conceptual framework is now tested in various projects.
The CBD TS77 Ecosystem Natural Capital – Quick Start package (ENCA-QSP) is a contribution to the implementation of the SEEA.

SNA



SEEA volume 1 "Central Framework"

SEEA volume 2 "Experimental Ecosystem Accounting"

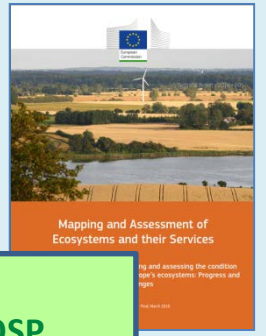
DEGRADATION

World Bank/ WAVES Applications

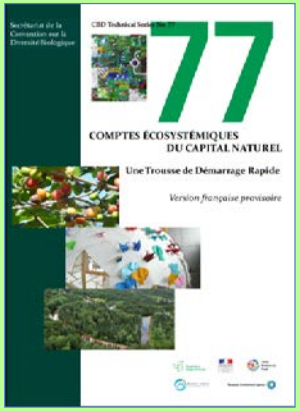
EEA: SEEA/ECA Ecosystem Capital Accounts

SEEA-EEA/ENCA Mauritius

JRC: MAES



UN CBD: SEEA/ENCA-QSP



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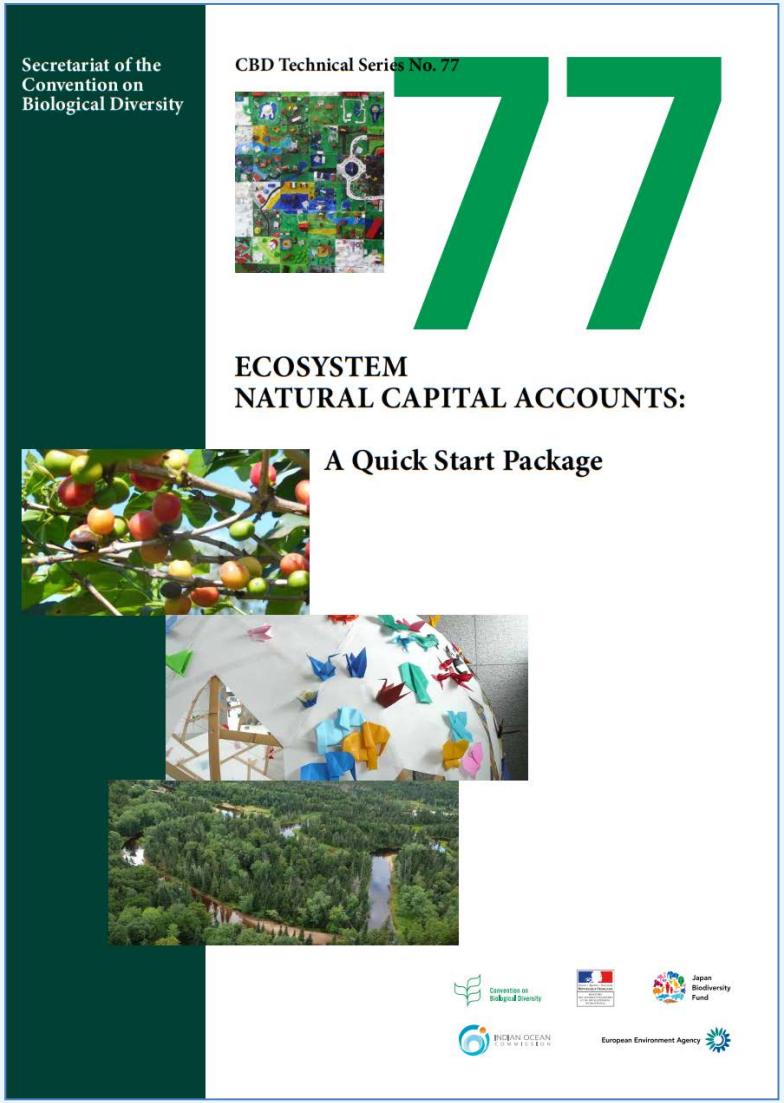
ENCA-QSP: A Quick Start Package to support the implementation of the UN SEEA-Experimental Ecosystem Accounts



- A response to the requirement of the **CBD Aichi Target 2** call for *incorporating, as appropriate and by 2020 at the latest, biodiversity values into national accounting*.
- A **Quick Start Package**
- A **technical accounting framework** for measuring ecosystem sustainable capacity, resilience and economic sectors' accountability to the ecosystem.
- It includes a **full set of tables** and guidance for compilation.
- Supported by **a tutorial for technical training** of experts (Kangaré)

http://www.ecosystemaccounting.net/

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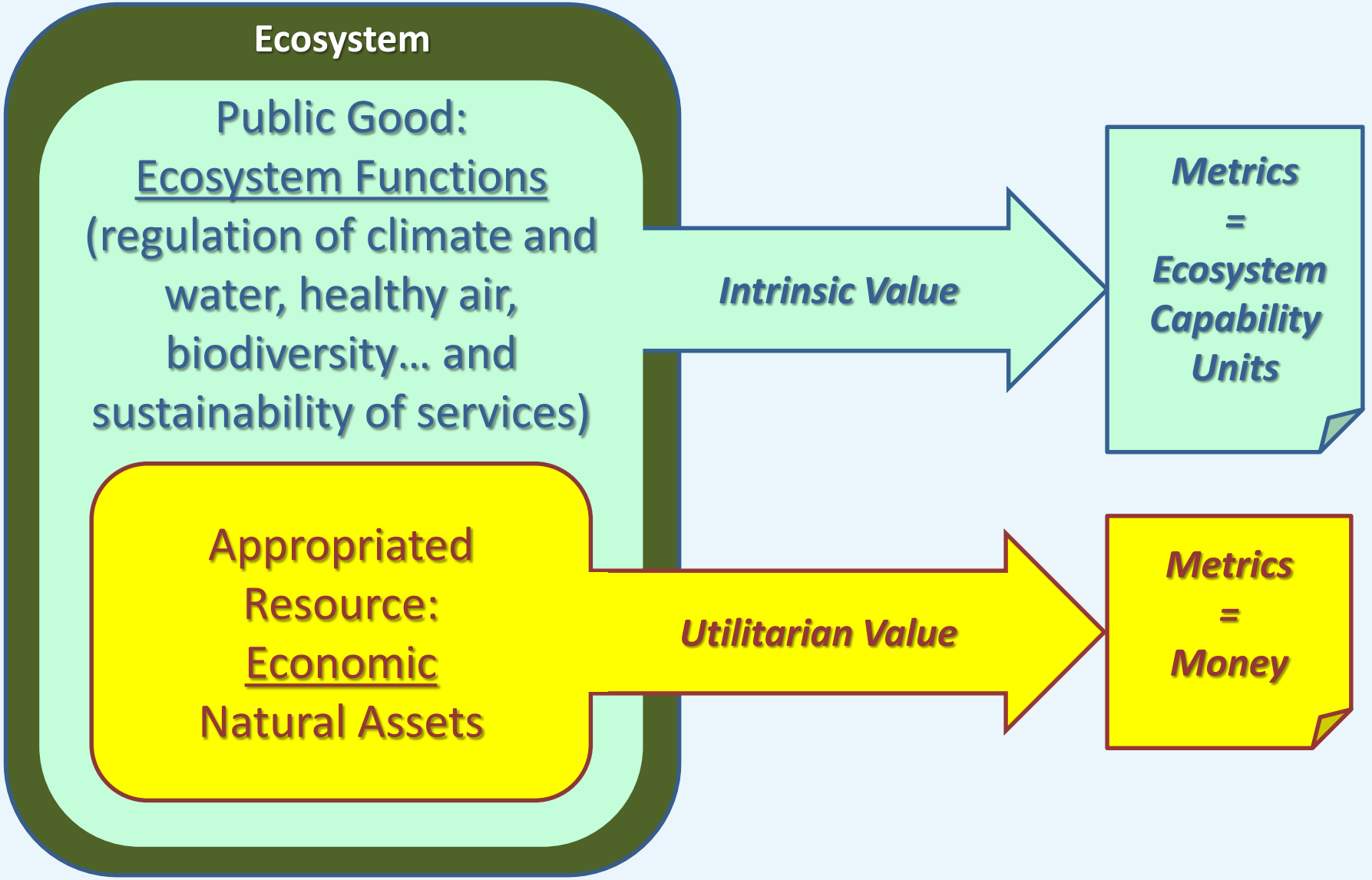
Which Accounting Metrics? ENCA Measures Ecosystems Intrinsic Value



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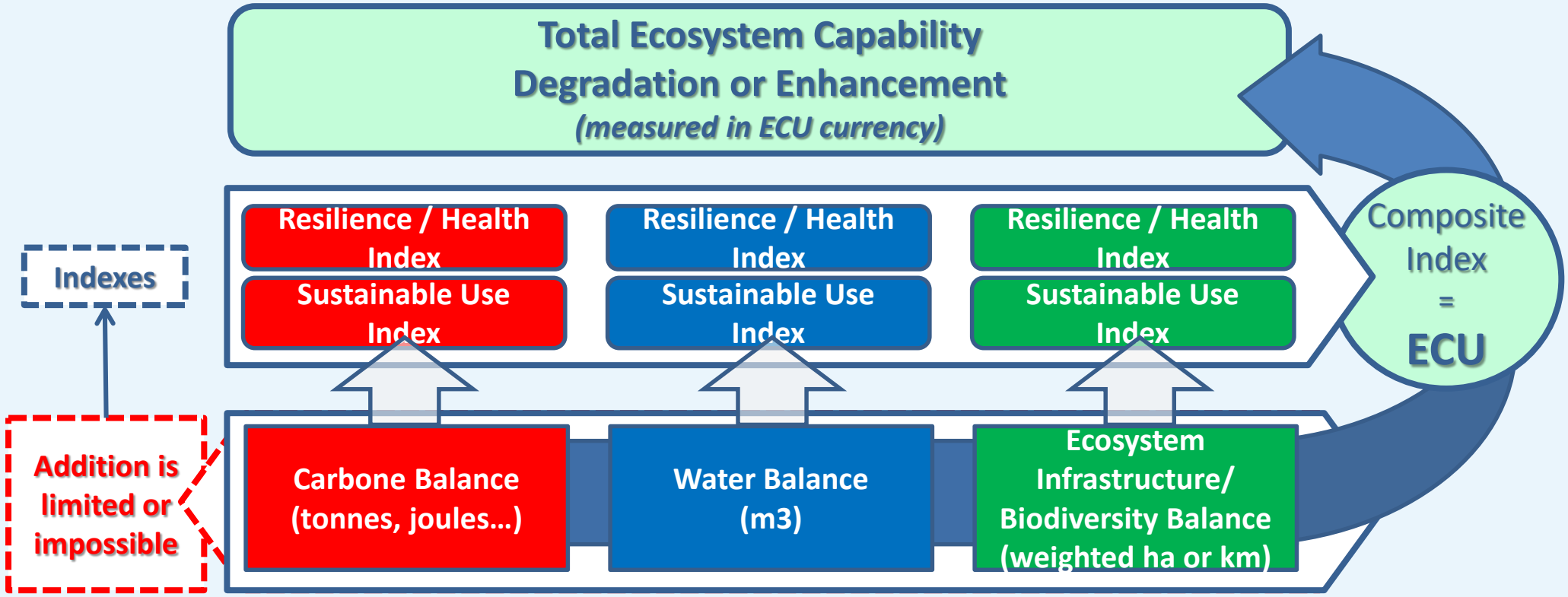
How to Account for Degradation? In Ecosystem Capability Units (ECU)

- **SEEA-EEA**: services and assets are integrated in monetary units. It measures **utilitarian value.**
- **ENCA-QSP** : integration of ecosystem capital with a composite index called **Ecosystem Capability Unit** (ECU). **ECU** is a currency to measure **intrinsic value**.



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Overview of CBD-ENCA-QSP

Unpaid costs (in $)
of restoration and offset
[today not recorded in the SNA and companies' accounts]

Ecosystem services values (in $)
(e.g. SEEA-EEA, TEEB, models…)

Ecological Balance-Sheet of Sectors and Companies (in ECU):
➔ **Ecosystem Physical Assets, Receivables and Debts**

➔**Total Ecosystem Capability,**
Degradation or Enhancement
(in Ecosystem Capability Units, ECU)

Assessment of key services in physical terms (e.g. MAES)

Resilience / Health Index	Resilience / Health Index	Resilience / Health Index
Sustainable Use Index	Sustainable Use Index	Sustainable Use Index
Carbone Balance (tonnes, joules…)	Water Balance (m3)	Ecosystem Infrastructure/ Biodiversity Balance (weighted ha or km)

Land cover account (ha) + Hydrographical network

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Ecosystem Natural Capital Accounts are Deep-rooted in Geospatial information

Economy

Total Ecosystem Capital Capability in ECU, Stocks and Change

Stocks

Enhancement

Degradation

Balance sheet in ECU of physical assets, ecological debts and receivables

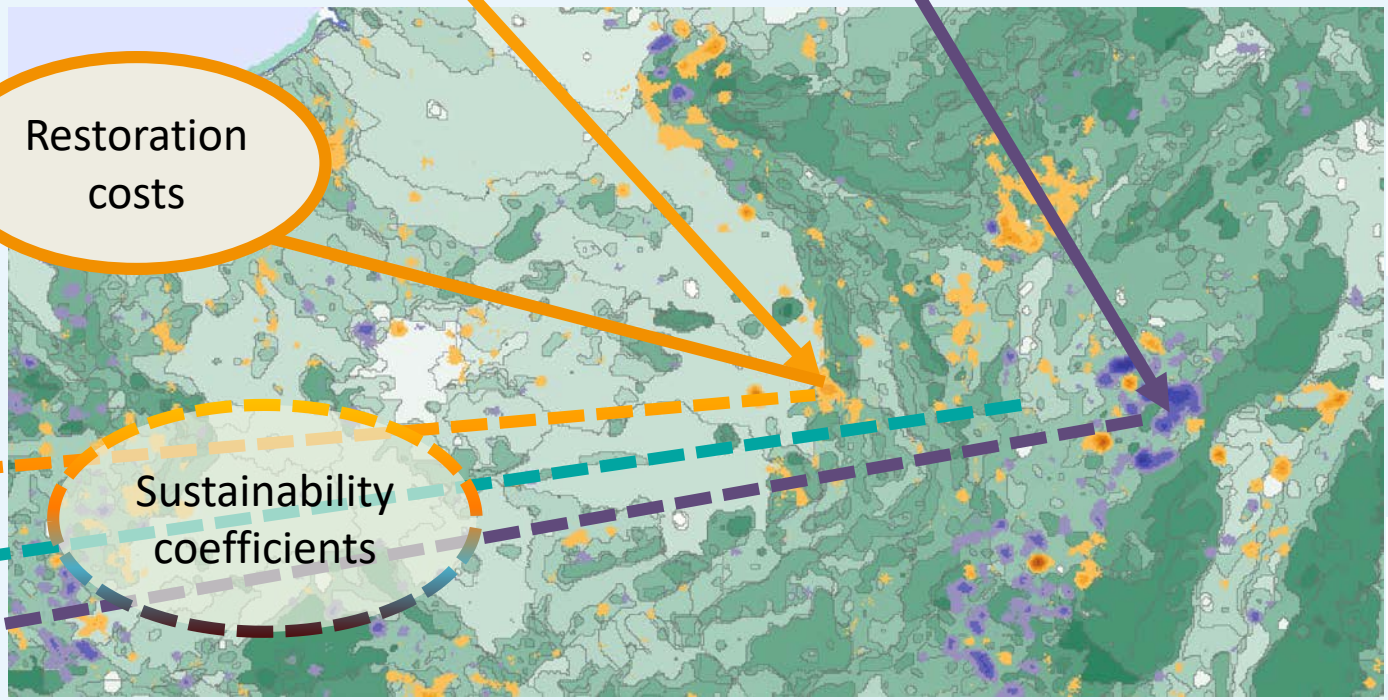
Unpaid costs:
Ecosystem Capital Consumption (National accounts) or Depreciation (Financial Accounts)

Final Demand at Full Price

Restoration costs

Sustainability coefficients

Ecological sustainability of Value Added supported by ecosystem services



Landscape Ecological Potential change 1990-2006, by ecosystem landscape units

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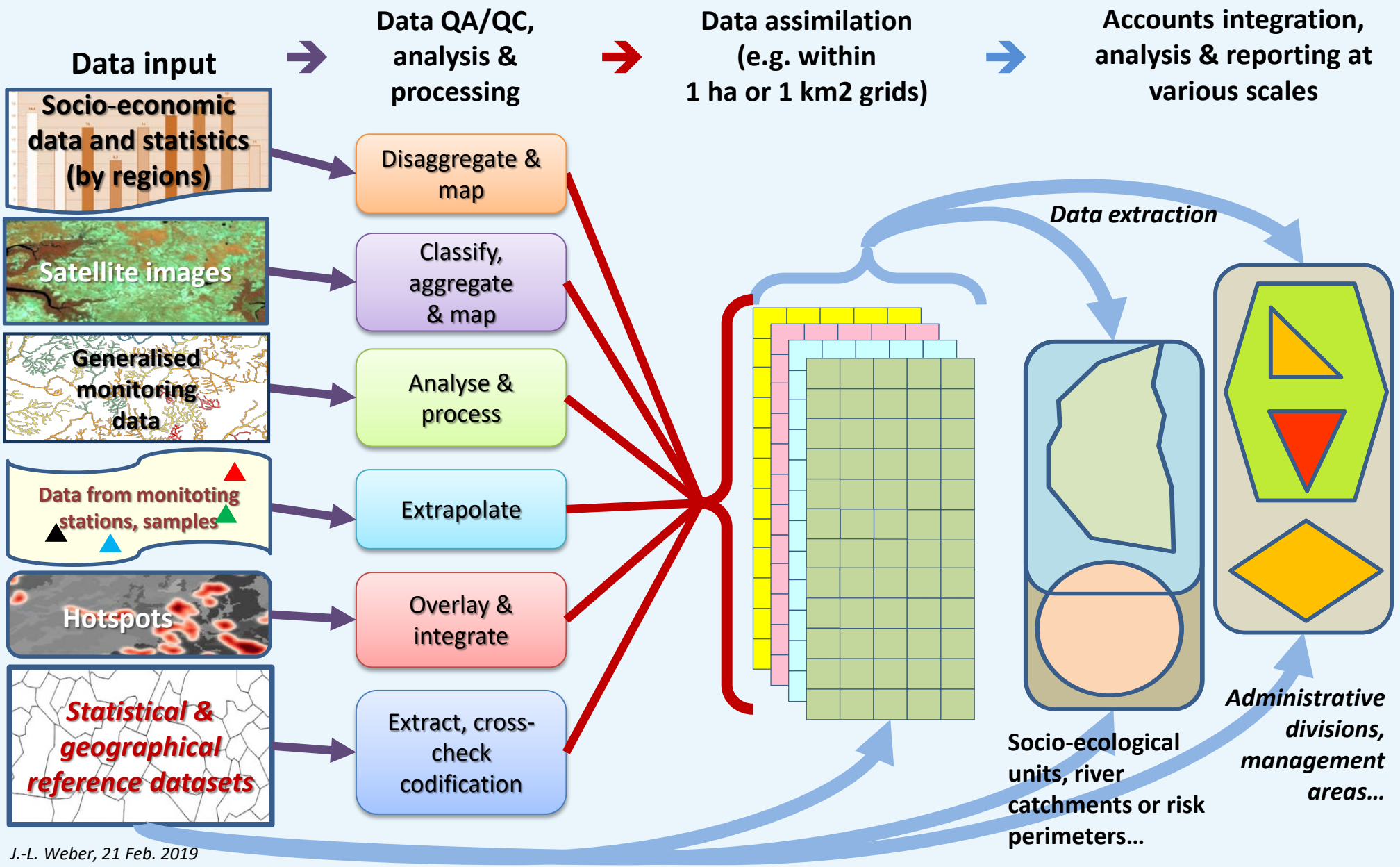
The ENCA-QSP Data Model: Assimilation & Integration of Statistics and Geo-Data



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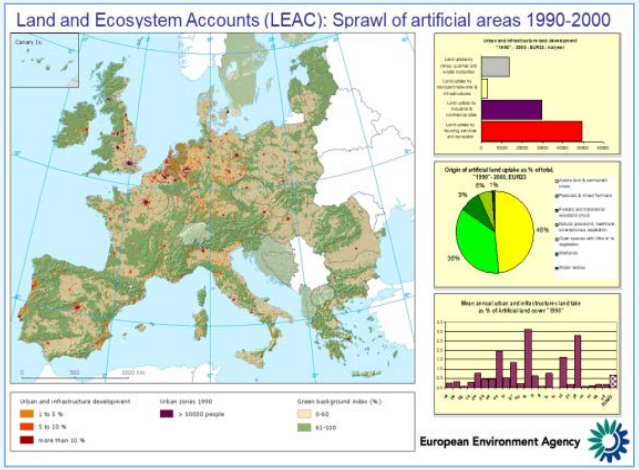
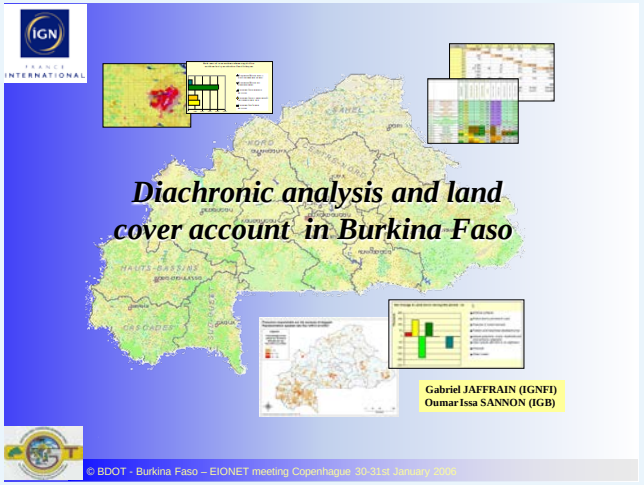
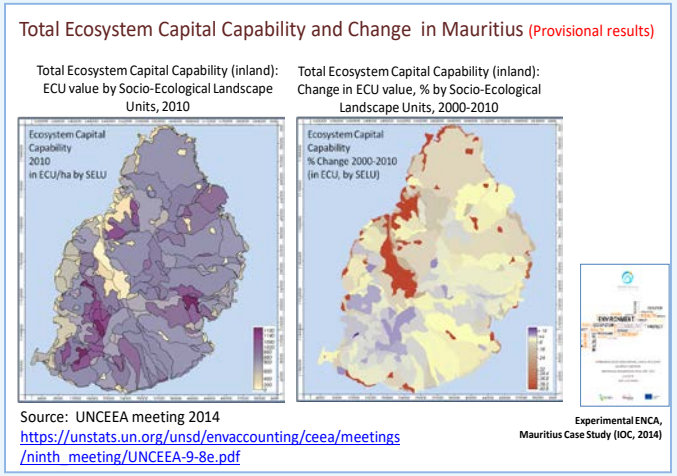
Examples of land and Ecosystem Natural Capital Accounts



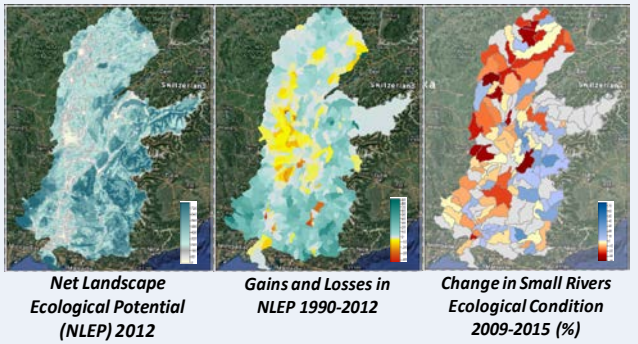
Land cover account for Europe:
Urban Sprawl 1990-2000 **(in red)**



Burkina Faso / IGB & IGNFI, 2009, LEAC/BDOT
Land over account 1992-2002



Pilot ENCA for Mauritius:
Total Ecosystem Capability (in ECU) (left)
and Change 2000-2010 (right)



Ecosystem Natural Capital Accounts of the Rhône River Basin
Preliminary results
(*Arguello J., Weber J.-L., Parmentier H. and Negrutiu I., 2018, ENS Lyon, France*)

ENCA for the Rhone River Catchment : NLEP (left), Change in NLEP 1900-2012 (middle) and Change in Small Rivers Ecological Condition 2009-2015 (right)

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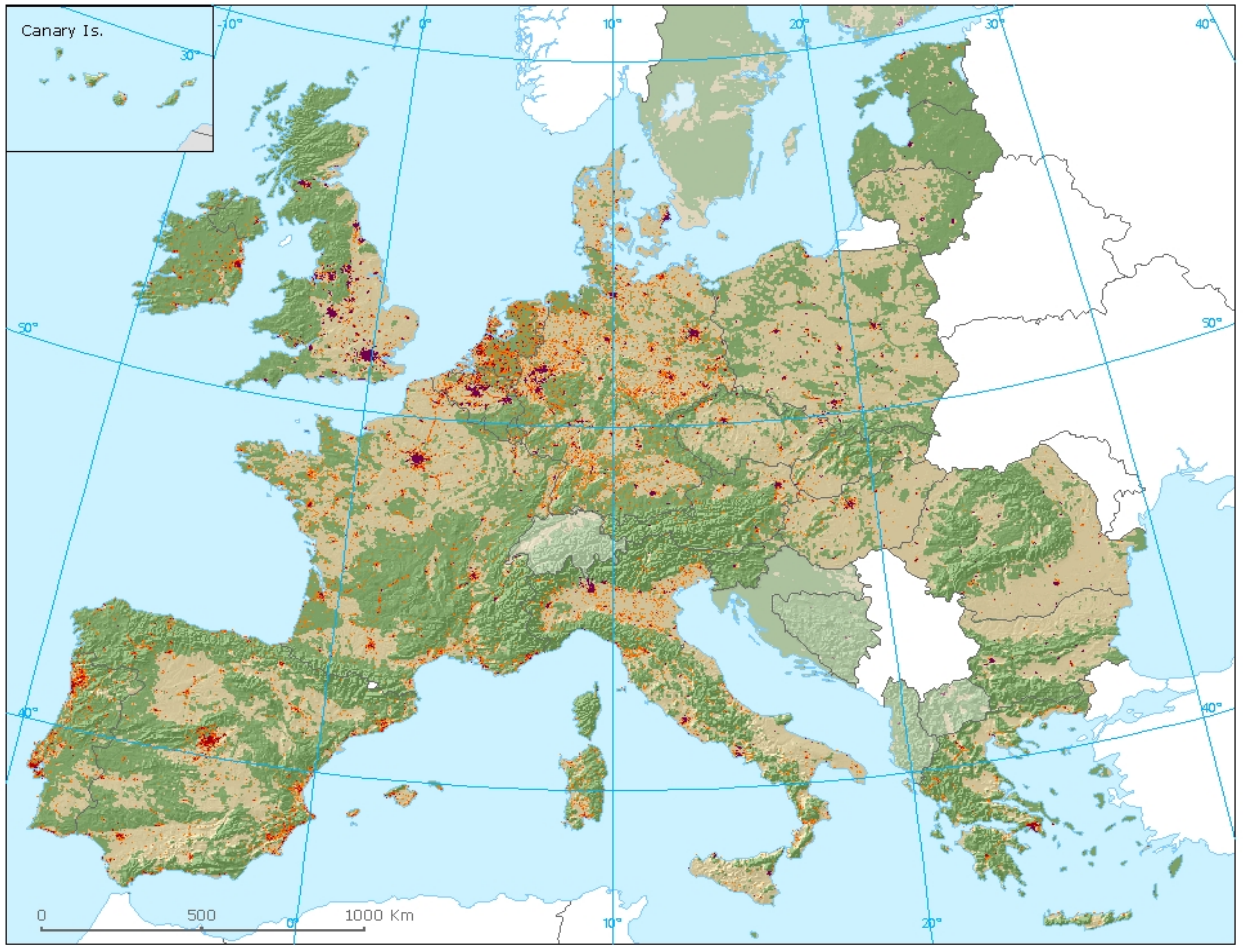
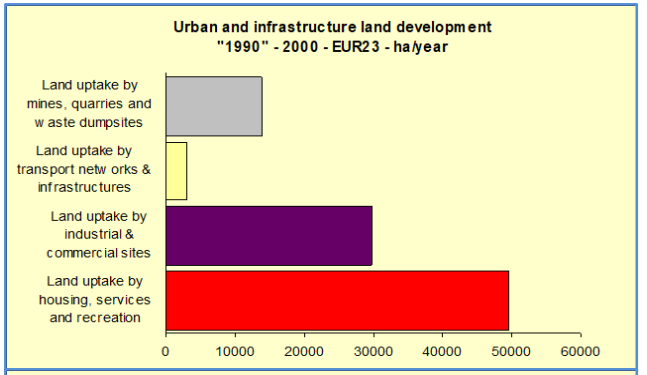
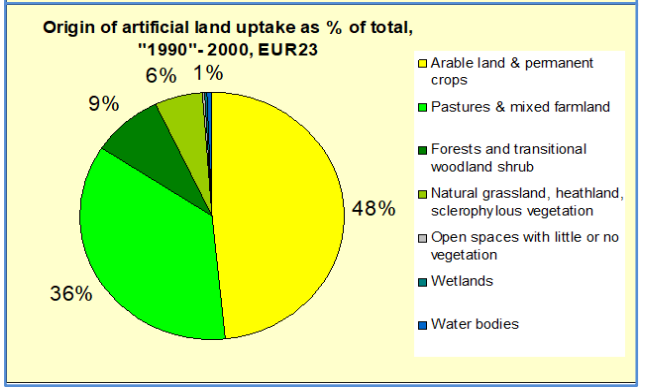
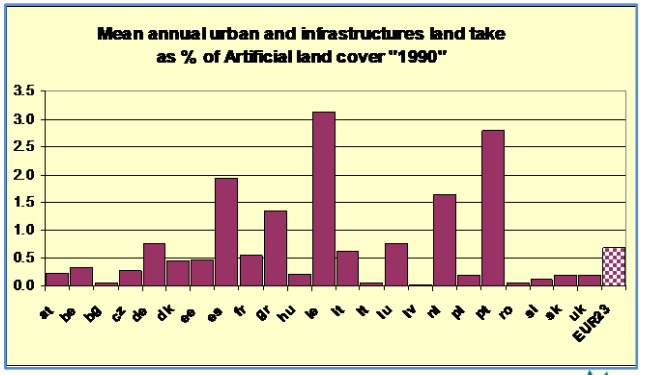
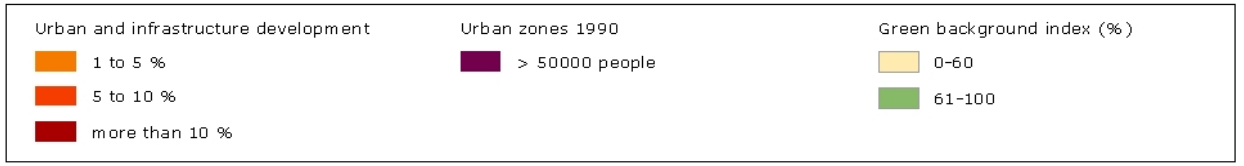
Land and Ecosystem Accounts in Europe: Sprawl of artificial areas 1990-2000







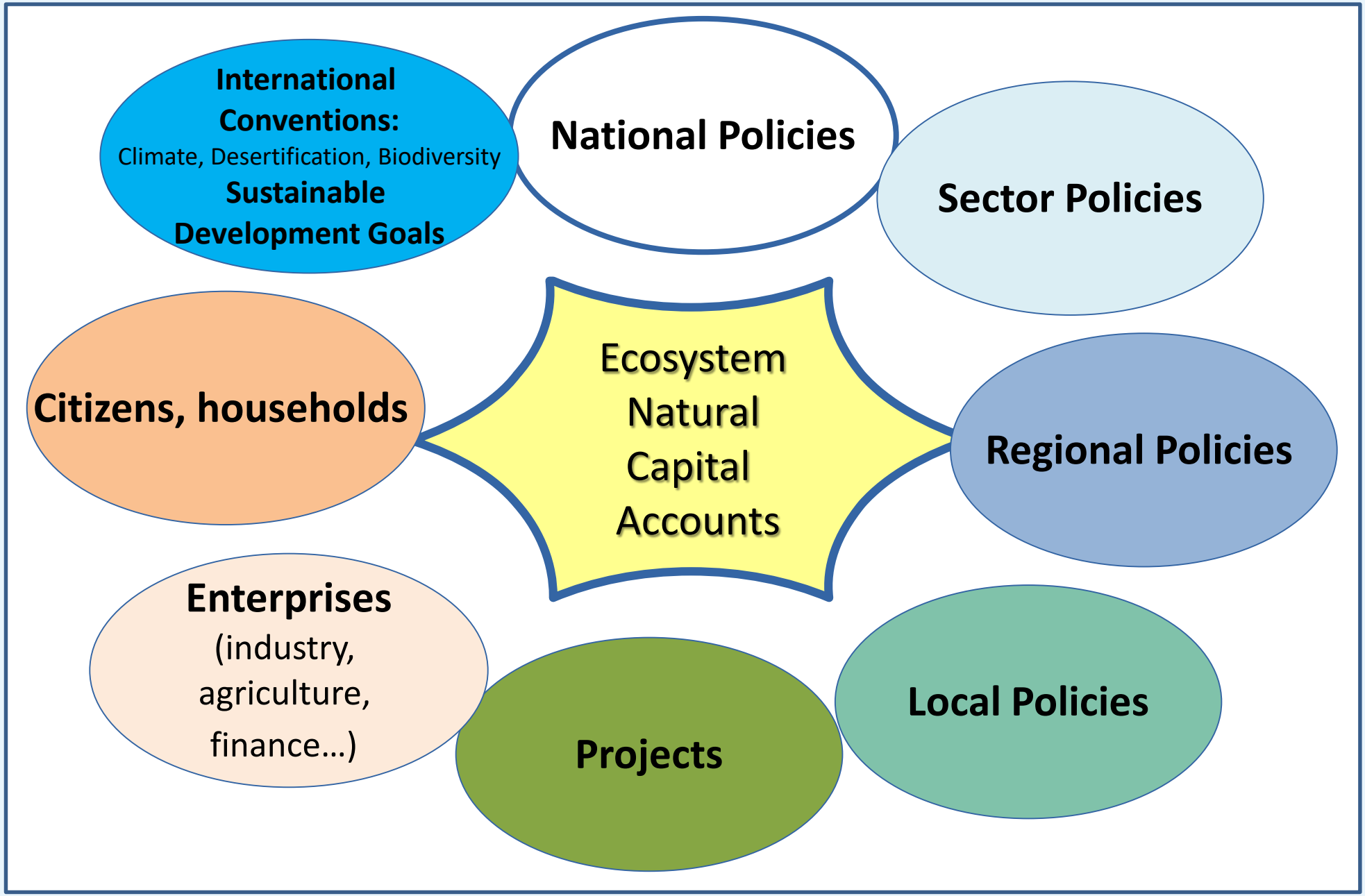


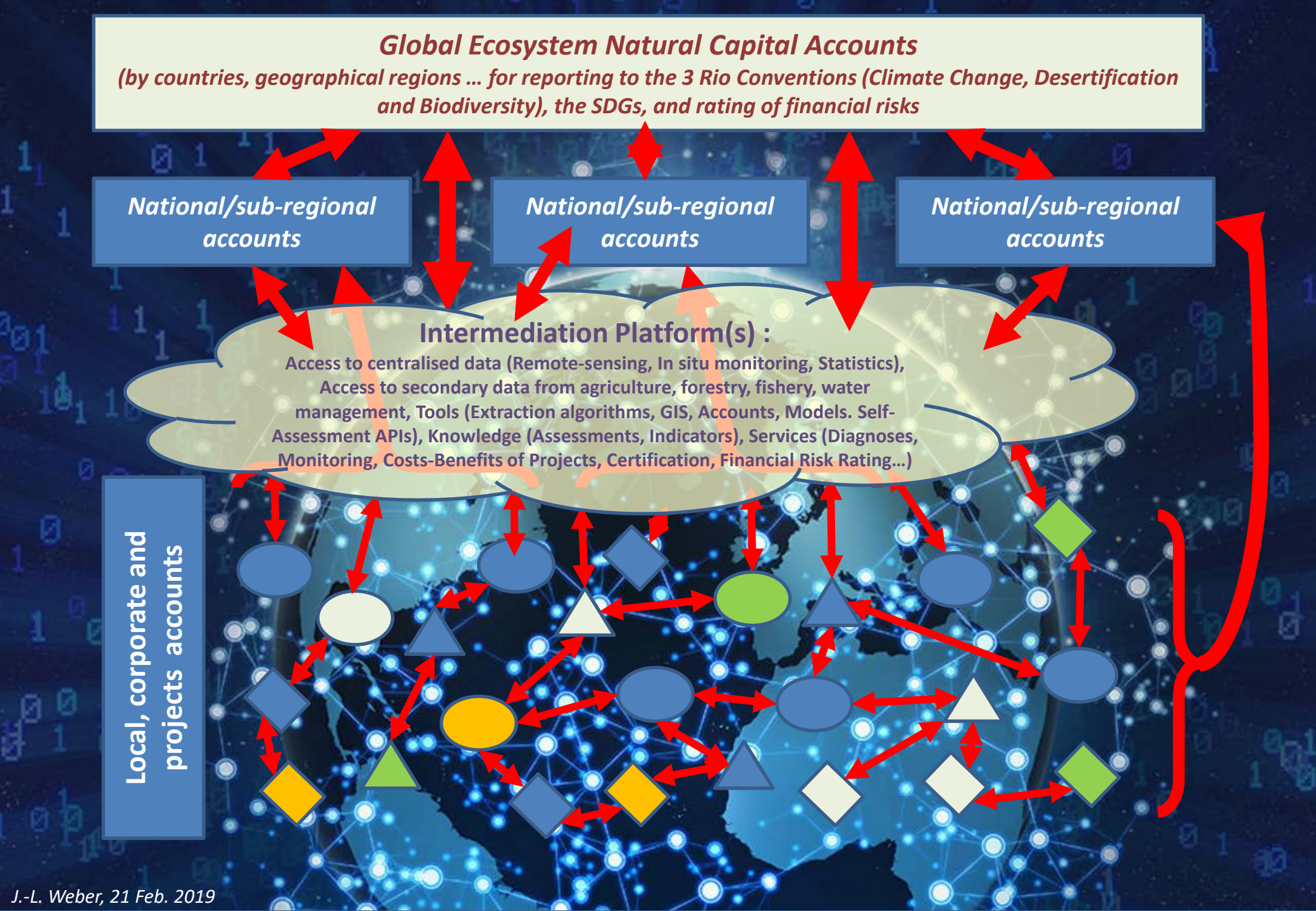


Source: European Environment Agency 2006

European Environment Agency

Liability to the Ecosystem: from local to global and vice-versa




Global Ecosystem Natural Capital Accounts
(by countries, geographical regions … for reporting to the 3 Rio Conventions (Climate Change, Desertification and Biodiversity), the SDGs, and rating of financial risks
National/sub-regional accounts
National/sub-regional accounts
National/sub-regional accounts
Intermediation Platform(s) :
Access to centralised data (Remote-sensing, In situ monitoring, Statistics), Access to secondary data from agriculture, forestry, fishery, water management, Tools (Extraction algorithms, GIS, Accounts, Models. Self-Assessment APIs), Knowledge (Assessments, Indicators), Services (Diagnoses, Monitoring, Costs-Benefits of Projects, Certification, Financial Risk Rating…)
Local, corporate and projects accounts
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The ECU Metrics and Policy Measures

Policies to Halt or Mitigate Ecosystem Degradation

Traditional policies

- Regulations, command & control
- Fiscal policy, taxes, PPP
- **Public procurements** (conditionality)

Novel or emerging policies involving all actors

- Statement of ecosystem degradation **& ecological debts**
- **Green finance** (conditionality)
- **Rating sovereign and private financial risks**
- Integration of **ESG** (Environmental, Social and Governance) risks factors (OECD)
- **Nature offset payments & banking**

Policies to Support Ecosystem Conservation & Enhancement

Traditional policies

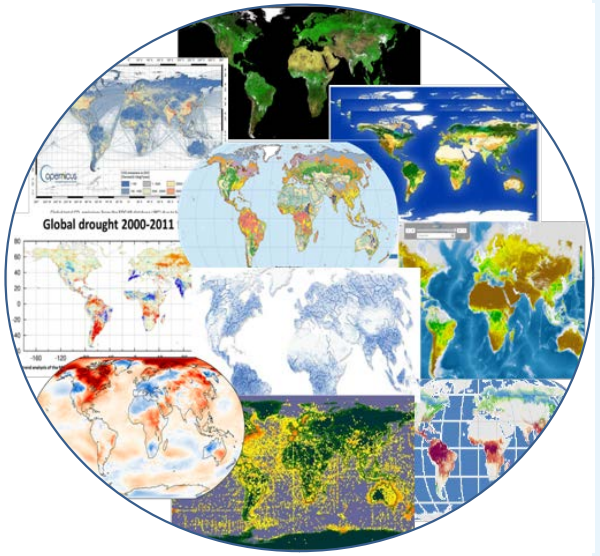
- **Public investments** (conditionality)
- **Subsidies to programmes** (conservation, reforestation, organic agriculture, water treatment…)
- **Public procurements** (conditionality)

Novel or emerging policies

- Statement of ecosystem enhancement and **ecological receivables** for nature conservation and restoration
- **Green finance** (conditionality)
- **Nature offset payments and banking**

ENCA at the Global Scale: the 3 Rio Conventions and SDGs

- Need of ecosystem natural capital accounts for better coordination of the **3 Rio Conventions** on Climate Change, Desertification and Biological Diversity
- Need of ecosystem natural capital accounts for **the Sustainable Development Goals** (UN SDGs)
  - Accounting is explicitly mentioned in targets 15.9 and 17.19
  - Deliver for several targets on water, food security, natural risks, ecosystems…
- Possibility of a Global ENCA by 2020
  - Quick start, using the best accessible global datasets and computing capacities (ESA CCI, Copernicus Global, NASA, JAXA, FAO Stat…)
  - Global mapping & accounting for physical ecosystem degradation or enhancement
  - A dream? **Presentation by EU at the CBD COP 15, in November 2020 in Beijing** for framing the discussion of the so-called **"2° biodiversity target"**



Thank You !

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