Biodiversity and natural capital within Green economy

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MSc course on “Green, Circular, Bio economy: limits and synergies of three sustainability avenues”
University of Helsinki
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1. Key concepts

2. What is “green” in green economy?

3. How to operationalise the “green” in green economy?

4. Why is linking green economy, circular economy and bioeconomy important?
Key concepts
Green economy

“... one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive”

Protection and restoration of natural capital a key component.
Ecosystem services (ES)
Natural capital (NC)

**ES:** Contribution of ecosystems to human and socio-economic wellbeing, direct or indirect

**NC:** Stocks and flows of these benefits, with understanding that they are limited
Nature-based solutions

Concrete approaches for the management of natural resources that build on the understanding of ES and NC

Provide concrete means for different sectors to transition to green economy

E.g. Restoration of wetlands for water purification
Conservation of carbon storage to mitigate climate change
Management practises that increase natural pollinators
Sectoral policy integration of ES & NC

Essential means for a transition to a greener economy.

Minimises damages to ES / NC
Maximises positive contributions of sectors to ES / NC
Achieving sectoral and wider policy objectives in a more sustainable manner, increasing policy effectiveness & win-win solutions
What is “green” in Green Economy?
ES and NC in Green economy

**Economy:** Long-term sustainability of economic sectors

**Society:** Equity and access to resources, role of world’s poor

**Individual:** Human wellbeing, with links to societal wellbeing and economic performance

**Stability:** Level of risks re: conflicts and instability, e.g. mitigation of / response to natural hazards
**Current situation**

*Declining sustainability in a “brown” economy*

- Resource over-exploitation
- Pollution
- Climate change
- Loss of biodiversity and natural capital
- Critical ecological thresholds passed / at risk
- Resource scarcity and limited access to a clear environment
- Negative health impacts
- Man-made natural disasters

*An economy that is neither resource efficient, low carbon nor socially inclusive*

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**Future ambitions**

*A green economy*

- Reducing environmental risks and ecological scarcities
- Staying within a ‘safe operational space’ for resource use and ecological thresholds
- No-net-loss of biodiversity
- Climate change within ‘acceptable’ limits
- Improved human well-being and social equity (e.g. health and livelihoods)
- Sustainability for future generations and business
- An economy decoupled from environmental impacts and resource use

*In Kettunen et al. 2017, adapted from ten Brink et al. 2012*
Biodiversity in Green Economy

Links between biodiversity and ES / NC are variable.

**Positive:** E.g. diversity of crop and fruit varieties for food security ...

**Neutral:** E.g. water regulation does not always depend on the composition / number of species ...

**Negative:** E.g. monocultures, commercial targeting of high-value species ...
Protected areas and green economy
Food security

Protected areas hosts a range of wild crop relatives

‘Live’ gene banks for crops, fruits and vegetables
Disaster risk reduction

Bhitarkanika Conservation Area / East India, protects 145 km² of mangroves

Following an intense cyclone in 1999, mangroves were demonstrated to have protected rice croplands and helped the recovery.

How to operationalise the “green” in green economy?
Knowledge, evidence and advocacy

Identifying and assessing the value of biodiversity and ecosystem services

- IDENTIFY and ASSESS the full range of ES / NC values and implications for different groups in society
- ESTIMATE and DEMONSTRATE the value
- CAPTURE the value of ecosystem services and seek SOLUTIONS
### Estimated benefits of national parks in Finland

Revenue and employment impact to regional economies estimated based on visitor numbers

Ongoing practice since early 2010

Helped to secure funding from national budget
Co-beneficiary management of ecosystems for Blue Carbon at the Balearic Islands

By Núria Marba et al.

<table>
<thead>
<tr>
<th>Ecosystem service</th>
<th>Biophysical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(633 km² seagrasses)</td>
<td></td>
</tr>
<tr>
<td>Carbon sequestration</td>
<td>89 Gg CO₂ eq yr⁻¹</td>
</tr>
<tr>
<td>Carbon storage (top 30 cm soil)</td>
<td>14 Tg CO₂ eq</td>
</tr>
<tr>
<td>Nitrogen removal</td>
<td>1.2 Gg N yr⁻¹</td>
</tr>
<tr>
<td>Fisheries commercial</td>
<td>0.18 Gg fish yr⁻¹</td>
</tr>
<tr>
<td>Recreation (expenditure)</td>
<td>(0.42 x 10⁶ € yr⁻¹)</td>
</tr>
</tbody>
</table>

Balearic MPAs: 180 km²
Economic value of avoided seagrass ES loss: ~ 0.5 million € yr⁻¹
Annual total cost surveillance of MPAs: ~ 0.7 million € yr⁻¹

http://www.rachelsussman.com/
Policies governing different economic and social sectors are the “gateway” for integrating ES / NC into the socio-economic realm.

→ Changes in sectoral policies form the basis for a truly “green” green economy.
Levels of policy integration

**Conceptual:** documents underpinning sectoral policies explicitly or implicitly take ES / NC into account

**Operational:** measures or instruments are identified and in place for ES / NC within policy sectors

**Implementation:** measures achieve integration on the ground in actual policy- and decision-making situations
Assessment of current level of ecosystem services integration in Scotland’s policy framework

**Aim:** To explore how explicit and comprehensive the Scottish policy framework was in integrating ES.

**Result:** Operational integration of ES is often significantly more limited than conceptual uptake. In comparison to the overarching EU framework, Scotland does as well as the EU if not better (Table 1) in most of the sectors assessed.

**Table 1: Current level of the integration of ES into sectoral policies in Scotland, using a traffic light evaluation system and a comparison with EU policy** (+ integration in Scottish policy superior to assessed EU level; = integration in Scottish policy roughly equivalent to assessed EU level; − integration in Scottish policy inferior to assessed EU level (Claret 2017).

<table>
<thead>
<tr>
<th>OPERAs</th>
<th>Environment: Air</th>
<th>Environment: Soil</th>
<th>Environment: Water</th>
<th>Agriculture &amp; Rural Dypt</th>
<th>Forest</th>
<th>Marine/coastal environment, fisheries</th>
<th>Climate</th>
<th>Bioenergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual integration</td>
<td>+</td>
<td>=</td>
<td>−</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>−</td>
</tr>
<tr>
<td>Operational integration</td>
<td>+</td>
<td>+</td>
<td>=</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
Means for policy integration

Interplay of a range of different policy instruments are needed to make integration happen.

<table>
<thead>
<tr>
<th>Information instruments</th>
<th>Data, indicators, monitoring, mapping, accounting, science-policy assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision-support instruments</td>
<td>Planning and targeting, supported by indicators, monitoring and mapping</td>
</tr>
<tr>
<td></td>
<td>Reporting, supported by indicators, monitoring and mapping</td>
</tr>
<tr>
<td></td>
<td>Impact assessment procedures and risk assessment and analysis</td>
</tr>
<tr>
<td>Implementation instruments</td>
<td>Dedicated legislative acts, regulations &amp; standards</td>
</tr>
<tr>
<td></td>
<td>Spatially specific instruments (e.g. protected areas, land-use zoning)</td>
</tr>
<tr>
<td></td>
<td>Public investment</td>
</tr>
<tr>
<td></td>
<td>Market-based instruments and certification</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>
Policy instruments in the context of sectoral policy cycles, to support ES and NC integration

In Kettunen et al. 2017 Making green economy happen (upcoming)
Implementation in practice

Nature-based approaches and solutions can green economies at all levels (national - regional – local / urban)

But ... be aware of domino effects, e.g. effects of climate change mitigation and adaptation measures on local populations globally.
Payments for ecosystem services (PES) in Mexico

Reduce deforestation and poverty
Deforestation rate ↓
GHG emissions ↓
Aquifer recharge ↑
Surface water quality ↑
Damage from flooding ↓

Source: TEEB for local and regional Policy

Fuente: Inventario Forestal Nacional 2000
• Nuuksio National Park / greater Helsinki area / Finland

• Located around 30 km from Helsinki
• Highly popular destination for both locals and visitors to Helsinki

• Number of visitors: 285 200 / year (2014) → 339 400 (2016)

• Accumulative economic impacts of visits to greater Helsinki area: 2.2 EUR mil / year (2014) → 3.9 EUR mil / year (2016)

• See Kettunen and ten Brink (2013) and http://www.metsa.fi/documents/10739/1366250/ptvaikutukset_2016.pdf/e8a3b43e-8e33-4593-b827-9821bb5357b8
Napa Valley natural flood management

Enhanced benefits: flood prevention, recreation & tourism

Costs of flooding ↓

Insurance rates ↓

Property values ↑
- Vitoria-Gasteiz / Basque Country / Spain (European Green Capital 2012)
- Affected by heatwaves
- City centre up to 5 degrees warmer than low-density areas
- Duration of heatwaves expected to increase in future
- Green belt around the city, connecting peri-urban areas - integrating Natura 2000 and Ramsar sites - continuously developed since early 1990s
- Tree lined corridors connect city centre with surrounding green belt: recreational opportunities and cooling comfort against urban heat

Source: ten Brink et al. 2016

Why is linking green economy, circular economy and bioeconomy important?
Ensure / maximise true improvements in sustainability within and between economic sectors

Maximise the delivery for nature and environmental conservation

Deliver for multiple Sustainable Development Goals (SDGs)
Linking CE with GE for SDGs

Linking CE to the delivery of GE is important, esp. in developing countries.

Green economy growth sectors depend on ecosystem quality (e.g. tourism).

Sustainability of economic sectors is interlinked!

World’s poor are highly dependent on ecosystems for individual wellbeing and security.
A truly green economy …

Understands the value of ES / NC, even when the values are not market based

Integrates the value into the foundations of decision-making (e.g. sectoral policies)

Provides right signals by removing harmful subsidies and creating incentives for sust. use

Invests in green: nature-based solutions & creating green jobs

Can be established at different levels: national – regional – local
Integration of ES and NC into socio-economic sectors is crucial for the concrete shift towards a truly “green” green economy.

This starts with the integration of ES and NC into the policies governing the different sectors.
Exercise:
GE-CE-BE vision for the EU Outermost Regions (ORs)
<table>
<thead>
<tr>
<th>Country</th>
<th>Distance from national capital (km)</th>
<th>Area (km²)</th>
<th>Population</th>
<th>GDP per capita as a percentage of the EU average (EU=100) (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
<td>-</td>
<td>4 407 569.1</td>
<td>508 450 856</td>
<td>100</td>
</tr>
<tr>
<td>France***</td>
<td>-</td>
<td>633 186.6</td>
<td>66 415 161</td>
<td>106</td>
</tr>
<tr>
<td>Portugal</td>
<td>-</td>
<td>92 226.0</td>
<td>10 374 822</td>
<td>77</td>
</tr>
<tr>
<td>Spain</td>
<td>-</td>
<td>505 944.0</td>
<td>46 449 565</td>
<td>90</td>
</tr>
<tr>
<td>Azores</td>
<td>1 548</td>
<td>2 322.0</td>
<td>246 766</td>
<td>69.2</td>
</tr>
<tr>
<td>Canaries</td>
<td>1 850 (average for all the islands)</td>
<td>7 445.0</td>
<td>2 135 722</td>
<td>78.2</td>
</tr>
<tr>
<td>Guadeloupe</td>
<td>7 578</td>
<td>1 681.6</td>
<td>393 392</td>
<td>73.1</td>
</tr>
<tr>
<td>French Guiana</td>
<td>7 841</td>
<td>83 533.9</td>
<td>262 527</td>
<td>58.4</td>
</tr>
<tr>
<td>Madeira</td>
<td>1 041</td>
<td>802.0</td>
<td>256 424</td>
<td>73.39</td>
</tr>
<tr>
<td>Martinique</td>
<td>7 641</td>
<td>1 128.0</td>
<td>376 847</td>
<td>77.03</td>
</tr>
<tr>
<td>Réunion</td>
<td>9 921</td>
<td>2 503.7</td>
<td>850 996</td>
<td>69.92</td>
</tr>
<tr>
<td>Saint-Martin (**)</td>
<td>6 700</td>
<td>86 (63 for the French side)</td>
<td>36 457</td>
<td>-</td>
</tr>
<tr>
<td>Mayotte</td>
<td>8 444</td>
<td>374.0</td>
<td>235 132</td>
<td>30.75</td>
</tr>
</tbody>
</table>

(*) Data for 2015, except for the Azores, Madeira and Martinique (2014) and Guadeloupe (2016); sources: Eurostat, Statistics Portugal.
(**) Sources: INSEE (France), 2015 and ‘Ministère Français des Outre-Mer’ (Ministry of Overseas France); no recent data available for GDP
(*** Total area for France includes the ORs but not the OCTs.

Source: Eurostat 2015
Questions

- How “green” is the new EU Strategy (2017) for Outermost Regions?
- How “green” is Saint Martin’s Action Plan 2014 - 2020?
- What kind of nature-based solutions did you spot for green economy?
- What possible risks for biodiversity might there and are these risks identified?
www.operas-project.eu

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www.oppla.eu

KNOwLEDGE + TOOLS + COMMUNITY
Further reading

Kettunen, M. et al. (2017) Making green economy happen: Integration of ecosystem services and natural capital into sectoral policies Guidance for policy- and decision-makers, guidance developed in the context of the EU OPERAs Project. [upcoming]


Thank you!

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