Measuring what you manage?

Proposals and prospects regarding ecosystem service indicators

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"A country could cut down all its forests and deplete its natural resources.

This would show only as a positive gain to gross domestic product, despite the loss of [natural] capital."

Robert Repetto, 1987; MA, 2005; TEEB, 2009





Dominican Republic

Peduzzi, 2005; TEEB, 2009



"Ecosystems are capital assets. When properly managed, they can yield a flow of vital services"

Gretchen Daily, 2000





André Künzelmann, UFZ, TEEB, 2009



"Any consumption that requires the running down of natural capital cannot be counted as income.

Failure to adequately account for it leads to major misperceptions about how well the economy is doing."

Costanza & Daly, 1992



"Ecosystems and biodiversity are our stock of natural capital. They lead to a flow of benefits that support societal and individual well-being and economic prosperity.

We do not measure this capital effectively enough to ensure its proper management and stewardship.

Without suitable indicators or accounting, we lack a solid evidence base for informed policy decisions."

Ten Brink et al. in TEEB, 2009



A framework for capturing ecosystem performance







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Examples of ecosystem performance indicators

Structure and processes	Ecosystem functions	Ecosystem services	Benefits
•Extent of wetlands situated between agricultural crops and a stream (waste processing)	 Removal of nutrients by wetlands 	 Water quality in aquatic ecosystems 	•Water consumption for drinking and sanitation
 Extent of non-built area 	 Infiltration capacity (volume/area/time) Soil & floodplain water storage capacity (volume/area) 	 Extent of safe area 	 Avoided costs of flooding
 Extent of forest, wetland, farmland, built area 	 Carbon storage capacity per hectare 	 Carbon uptake by ecosystems 	∙€/ton C
Ecosystem Capital		Ecosystem Output	Ecosystem Outcomes

Sources: Jacobs et al., 2010; TEEB, 2009; WRI, 2010





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A framework for organizing indicators



<u>http://www.esindicators.org/indicators_overview</u>
World Resources Institute, Washington D.C.



3. Performance measurement: potential and pitfalls

Indicators can be used to check

- To check whether actions or policies are implemented
- To check whether they achieved their intended results
- To check whether new factors have arisen
- To provide accountability
- To defend budget proposals
- ...

Therefore indicators should:

- Relate directly to policy options, goals or targets
- Capture change over time
- Identify critical thresholds or irreversible changes
- Provide early warnings
- ..

Millennium Ecosystem Assessment, 2003



3. Performance measurement: potential and pitfalls

1.validity and reliability:

Are the collected and reported data accurate? Do the indicators measure what they claim to measure?

2.functionality

Are the indicators relevant and do they contribute in realising policy objectives, or do they trigger perverse or dysfunctional effects?

3.legitimacy

Are the indicators and their use understood and accepted by all stakeholders involved?



3. Performance measurement: potential and pitfalls



Legitimacy

Sources: Bouckaert, 1995; Bouckaert & Auwers, 1999



4. Discussion points

1. In what way would ecosystem service indicators in Belgium be most useful?

e.g. in policy plans, decision-support tools, scenario-analysis, budget negotiations policy evaluations, local/regional land use negotiations, ... ?

2. Could you suggest a comprehensive set of indicators for the following ecosystem services? What difficulties did you encounter?

(a) pollination, (b) water retention and (c) recreation

3. How could indicators help in linking knowledge from experts, policy workers and (local) stakeholders? Via which strategy could this be approached?

