Lessons in measuring ecosystem status (SEEA-EEA Mx)

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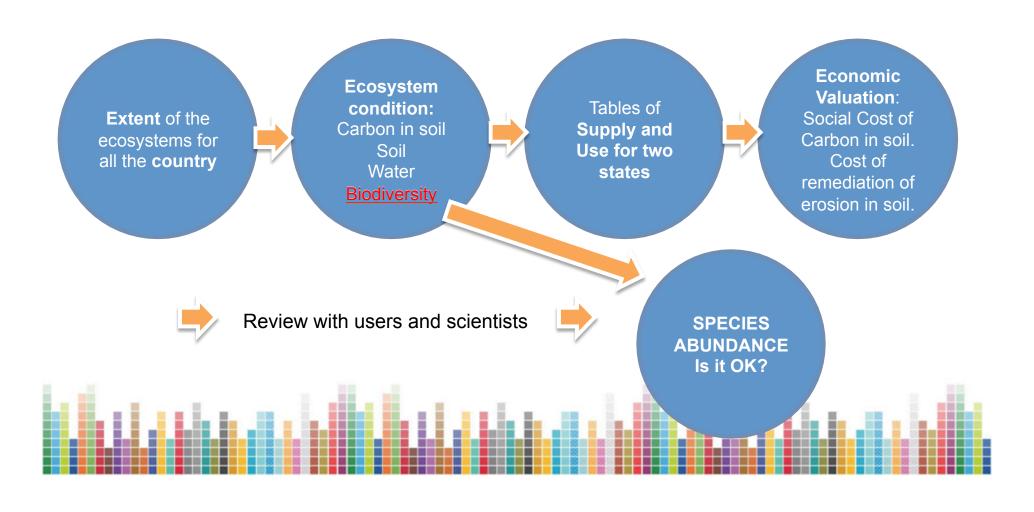In the year of 2014 **Mexico** started as a **pilot** in the implementation of the SEEA-EEA.

Technical Working Group (TWG) with institutions of the mexican environmental sector and international agencies (*stakeholders*).

Work *face to face* with each institution.

Multidisciplinary work: Economists, national accountants, biologists, geographers, engineers, academics, scientists, etc.

The sequence of accounts and the review process

Extent of the ecosystems for all the **country** →

Ecosystem condition:
Carbon in soil
Soil
Water
Biodiversity →

Tables of **Supply and Use for two states** →

Economic Valuation: Social Cost of Carbon in soil. Cost of remediation of erosion in soil.

→ Review with users and scientists →

SPECIES ABUNDANCE Is it OK?

Condition accounts. Biodiversity

"*The four indicators concerning the **state of biodiversity** that emerged from these discussions are:*
(a) Trends in extent of selected ecosystems;
*(b) **Trend in abundance and distribution of selected species**;...*"
(SEEA-EEA - 4.114)

"*Accounts showing the risk of extinction can be constructed using the status of species as defined by IUCN **Red List categories** and related criteria (table A4.2.1)...*"
(SEEA-EEA- A4.24)

Feedback with scientists

Condition accounts. Biodiversity

Red List has information at global level.

NOM-059-SEMARNAT-2010 has specific information on the mexican biodiversity.

Use of information about sighting birds from   a project called "AverAves"

⚠️ But species abundance is not useful to reflect the biodiversity condition

Condition accounts. Integrity of trophic chains

The condition of biodiversity depends on processes such as the trophic chain, which consists in the transport of energy among the organisms of a biological community.

One way to measure the **condition of an ecosystem is through disturbances in the trophic chain**, for example, by the extinction of a mammal located at the top of trophic chain.

Condition accounts. Ecological Integrity Index (EII)

Scientists in the country recommend using an ecological Integrity index (IIE), such as the capacity of ecosystems to sustain self-organization and stability processes, while maintaining their natural condition.

Therefore, the predator-prey interaction (composition, function and structure) has effects on the quality of the remaining habitat, on spatial integrity, on Habitat functions, on trophic connectivity and on mobile connections.

Proposal for Franz Mora, CONABIO

Condition Accounts. Ecological Integrity Index (EII). Depredators mammals

The loss of predatory mammals has direct and indirect effects on ecological integrity.

Direct:
- Habitat loss and fragmentation
- Lost of biodiversity (secondary extintions)
- Populations insulation

Indirect:
- Cascade effect (removal of herbivores, release of meso-predators)
- Trophic degradation (loss of trophic functions)

Condition Accounts. Ecological Integrity Index (EII). Depredators mammals

- Without large predators
- Trees less diversity
- Many large herbivores
- Birds less diversity

- Big and small predators
- Few large herbivores
- High diversity of plant communities

Integridad ecológica

Structural equation model

Value

Alta : 1.0

Baja : 0

Kilometers

0   125   250   500   750   1,000

Conclusions

- Dialogue with biodiversity experts helps to refine the vision of the application of the SEEA-EEA.

- The work with scientists allows to know other approaches in the measurement of the ecosystems condition (like the ecological integrity index, that also helps in the measurement of the economic value of the biodiversity).

- The opinions of the scientists should be reflected in the results of the pilot exercise.

- Condition ecosystem accounts are more complex than was believed in reviewing the SEEA-EEA manual, so it should be analyzing in more detail.

Questions for LG

- Is it considered appropriate to review in greater detail the references to the ecosystem condition accounts in the SEEA-EEA?

- How should the review process of the handbook beside the scientists on the theme of biodiversity (if it is appropriate)?

- What other country projects can throw more knowledge on condition accounts (similar to the Ecological Integrity Index)?

- How to direct these proposals to be quantifiable in the terms of the SEEA (tables in physical and monetary units)?

Thanks for your attention!

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