Virtual Expert Forum on SEEA Experimental Ecosystem Accounting 2020
Session 2: Valuation and accounting treatments
Carbon

Bram Edens
15 July 2020
Outline

• Context and issue
• The carbon retention proposal
• Why carbon retention?
• Example from NSO India
• Discussion
**Context**

- Agreement of the importance of compiling carbon accounts (in physical terms) that describe stocks and changes in stocks of carbon.
- Since 2019 Forum (and before) – ongoing discussion about how to reflect carbon related service(s) in the ecosystem supply-use table (on physical and monetary units).
  - Is it a service or a process? Final or intermediate?
  - Sequestration only? Storage only? Both?
  - Other options?
- SEEA EEA TC (in May) discussed various options (with pros and cons) and broadly agreed with carbon retention approach, noting some further clarifications were needed.
What is wrong with seq. / storage?

• Sequestration (only):
  > Asymmetry: only deals with removals from the atmosphere, silent on situation on (net) emissions from peatlands (e.g. due to soil subsidence).
  > Perverse policy incentives (e.g. replace a tropical old growth forest by fast-growing bamboo);
    - Loss of stored carbon would not show in degradation costs (only extent to which this would change future sequestration services;)
  > Unclear what metric for sequestration would be most appropriate: NPP, NEP (net of soil respiration), NECB (net of timber harvest).

• Sequestration + emissions
  > Need to recognizing disservices in the account (with negative output)

• Sequestration + storage
  > Unclear how to value a distinct storage service that avoids double counting
Carbon retention proposal

- Retention can be defined as:
  > (i) estimate carbon stocks,
  > (ii) multiply this by a suitable carbon price, and
  > (iii) turn this into an annual service flow by multiplying this value by a suitable rate of return (to create an annuity).

- This framing recognizes that the retained carbon stocks represent a value (avoided damages).
  > In physical terms, the amount stored is a “proxy” for the service flow provided;
  > in monetary units, the service flow is the annual annuity, with higher annuity flows reflecting higher levels of ecosystem services provision.
Why carbon retention?

- Retention provides the ‘right’ signals to policy makers;
  - if an ecosystem loses carbon, we have lower retention services;
  - ecosystems with high carbon stocks (e.g. tropical rainforests) would get high retention values (even though oftentimes they have low sequestration (as they are in equilibrium / old growth); sending the signal that they are worth conserving;
  - in case of logging, the accounts display the range of trade-offs of services;
- the focus on storage aligns well with REDD+ schemes;
- on the data availability side, getting estimates of carbon stored (needed for retention) seems to be easier for most countries than getting estimates for sequestration
- change in the level of service can be decomposed into changes due to sequestration and removal/loss of carbon.
Questions for discussion

• Do you have comments on the carbon retention proposal, specifically on its relationship with carbon sequestration?
• Where should the boundaries of carbon stocks be drawn (subsoil carbon, blue carbon, long-lived / short-lived biomass)
• What issues do you see in deriving an annuity / user cost estimate in valuing the flow of the service?
• To what extent should the risk of the release of carbon be factored into the price?
Retention and sequestration

- Hypothetical: physical stock of 10 (price per tC of 1), discount rate of 10%, assume sequestration of 1 during the accounting period and no sequestration after:

<table>
<thead>
<tr>
<th>10%</th>
<th>t0</th>
<th>t1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Retention</td>
<td>1.00</td>
<td>1.10</td>
</tr>
<tr>
<td>present value</td>
<td>($9.91)</td>
<td>($10.91)</td>
</tr>
<tr>
<td>present value</td>
<td>($0.99)</td>
<td></td>
</tr>
</tbody>
</table>

- Sequestration recording would result in a service value of 1 (in t0), but 0 in years after.

- Retention recording would also be 1 (in t0, but 1,1 in t1 and after)

- However, in the retention approach, we also see that the change in PV is 1. This would be recorded as an ecosystem enhancement (investment), assuming that sequestration leads to permanent storage.