



System of
Environmental
Economic
Accounting

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Session 2: Valuation and accounting treatments

Carbon

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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:

10%		t0	t1
	Stock	10	11
	Retention	1.00	1.10
	present value	(\$9.91)	
	present value	(\$10.91)	
		(\$0.99)	

- 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.