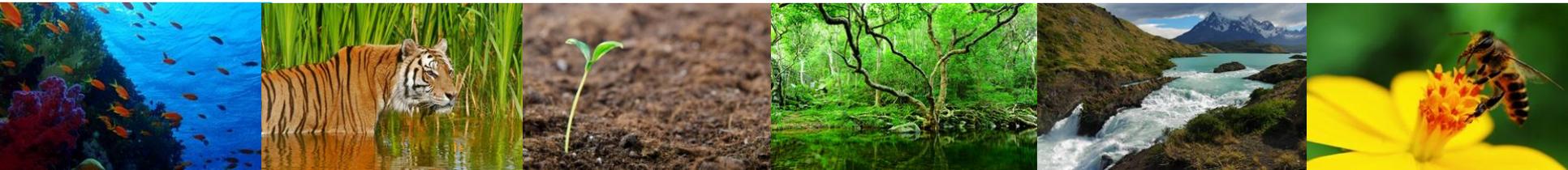


Towards Monetary Forest Accounts: Experimental Methods for Valuing Forest Ecosystem Services

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1. Why it is important?

- a single measurement unit is needed to aggregate/compare different benefits and costs
- monetary units are a commonly-used decision-making metric
- what can valuation achieve?
 1. raising awareness and mainstream their value into decision-making
 2. undertake a full economic evaluation of land use decisions
 3. design economic incentive instruments (e.g. payment for ecosystem services)
 4. derive total economic value of forests and its contribution to the economy
 5. **augment SNA estimates** (e.g. depletion adjusted, green GDP)
 6. calculate improved macro-economic sustainability indicators (e.g. comprehensive wealth, genuine savings)

2. What to value?



- **benefits forests provide for humans** = final goods and services that generate utility and alter human welfare
- values depends on who benefits where → **variety of beneficiaries**
 - in different sectors
 - forestry (e.g. logging, wood, etc)
 - non-forestry (e.g. agriculture, energy, water, tourism, etc)
 - across different scales
 - local (e.g. forest land user, downstream municipality)
 - national (e.g. industries, governments)
 - global (e.g. international community)

2. What to value?

Forest Ecosystem Services*		Examples: Forest Benefits
<u>provisioning services</u>	timber	timber
	firewood/ charcoal	wood-based energy
	non-timber forest products (NTFP)	food, fodder, medicine
	genetic material	product development
<u>regulating services</u>	grazing	livestock feeding
	pollination	agricultural production
	water flow regulation	hydro-power production
	soil retention and formation	sedimentation control
	water cycle regulation	(drinking) water supply
<u>cultural Services</u>	atmospheric/climate regulation	carbon storage/ sequestration
	recreation	tourism
	information and knowledge	research/ education
	spiritual & symbolic	cultural heritage, identity, spiritual/ religious functions
	non-use	existence/ bequest

* according to the Common International Classification of Ecosystem Services for the SEEA Experimental Ecosystem Accounting

2. What to value?

- 1. direct market benefits:** final forest goods & services that can be traded in markets
 - goods produced for the market (e.g. timber, firewood/charcoal, NTFP)
 - goods produced for self-consumption/informal exchange (e.g. timber, firewood/charcoal, NTFP)
 - regulating services with a market price (e.g. through carbon trading/tax, PES)
- 2. indirect (quasi-) market benefits** contribute to production of market goods and services by other economic activities (agriculture, energy, water, tourism)
 - attribute of a heterogeneous non-forest market good (e.g. recreation, information/knowledge)
 - complementary input in non-forest production (e.g. genetic material, grazing, pollination, water flow/cycle regulation, soil retention)
 - substitute-input in non-forest production (e.g. water flow/cycle regulation, soil retention)
- 3. non-market benefits:** services that do not contribute to market goods and services
 - other regulating services
 - cultural benefits (e.g. cultural heritage, local identities, spiritual or religious benefits)
 - non-use benefits (bequest, altruist and existence values)

- ***approaches to value forest land (according to SNA):***
 - land value observed at markets
 - replacement costs
 - **net present value of future returns**
- ***exchange value concept*** to make values compatible with SNA
 - monetary value at which goods or services are in fact exchanged or else could be exchanged for cash
 - market prices
 - market-price equivalents
 - production costs
 - ***≠ welfare economic value concept:*** full marginal value that accrue to society today and in the future
 - shadow prices that reflect market inefficiencies and constraints
 - social prices that account for externalities and public goods

3.2 How to value?

Valuation techniques

method		market benefits	indirect (quasi-) market benefits	non-market benefits
1. market-based	resource rent	X		
	production costs	X		
	replacement costs	X	X	
	damage costs		X	
2. revealed preference	production function		X	
	hedonic pricing		X	
	travel costs		X	
3. stated preference	contingent valuation		X	X
	choice experiment		X	X
4. benefit transfer		X	X	X

4. What do we need?

- overcome political resistance ('commodification of nature')
- technical capacities and extensive data to make valuation compatible with SNA
- methods need to advance to:
 1. incorporate marginal value concept
 2. account for non-linear relationships/thresholds
 3. understand spatial relationships
 4. dealing with uncertainty
 5. avoid double-counting
- acknowledge contribution of forests to wider social values and multiple dimensions of human well-being

Thank you!

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