Tropical forest management for climate change mitigation, sustainable development and biodiversity conservation: Are we dreaming?

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Tropical forest carbon stock change drivers

- Landuse change is key – fluxes almost irrelevant
- Complex ecologies, high C turnover rates
- El Nino-induced fire regimes expanding
- High levels of poverty, high rates of population increase
- Dysfunctional institutions (rules, regulations, organizations)
- Degradation and inappropriate deforestation increasing due to the above
Conflicting objectives:
Interactions galore...

Net carbon sequestration increased
- Low cost options sought
- Long-term storage desired

Biodiversity conserved
- Often increases costs
- May reduce livelihood options

Sustainable development enhanced
- Landuse flexibility sought
- Stable income desired
Biodiversity conservation

- Opportunities limited until forest conservation included
- Museum taxonomists vs. local people
- Relationship between C stocks and biodiversity within biome?
Biodiversity x C in Sumatra

Above-ground Carbon and Plant Biodiversity
All ASB benchmark sites

Vegetation (biodiversity) index

Above-ground - C t/ha

Crop
Pasture
Fallow
Tree-based
Managed Forest
Primary Forest
Employment x C stocks in Sumatra
Owner benefits from natural forest corridors

Profitability of Concession

Proportion of Concession in NFC

show supporting factors  show stakeholder benefits
Stakeholder Benefits

Cumulative importance value of 10 most important tree species used by local community (for non-timber purposes) in NFC

Density of primates in concession

Density or Connectivity of NFC in concession

* No primates within plantation stands

Density of NFC in concession

show supporting factors

show owner benefits
Supporting factors

- Pest incidence per ha plantation stand
- Wind damage (windfall, ha fall/ha plantation stand)
- Sedimentation of streams (sedimentation rate, width of NFC)
- Occurrence of invasives/fires (density of NFC in concession)

show stakeholder benefits
show owner benefits
Sustainable development

- Defined by host countries
- Ineffective as an exclusionary criteria
- Generally assumed to include benefits to local people
- Incredibly complex, difficult to achieve in most parts of the tropics
Pre-project constraints to community development - Ecuador
Exotics x native species: Profaforo project in Ecuador
Impacts of NKCAP on local communities

‘Costs’ of project
- Loss of benefits provided by concessionaires
- Loss of access to the land on the east side of the river

‘Benefits’ of project
- Sustainable community development and leakage prevention program - sustainable forestry management, health, education, infrastructure
- Employment in forestry support programme, eco-tourism, monitoring and verification, park protection
- Improved pastures
Impacts of Profafor on project beneficiaries

**Benefits of project**
- establishment subsidy
- training in forestry management
- reduced land invasions and theft

**Costs of project**
- removal of cattle from area under plantation
- low opportunity cost of land and labour
- capital costs to individual landholders
Dealing with conflicting objectives

- Recognize and quantify tradeoffs
- Reduce expectations
- Focus on “no-regrets” solutions for now
- Work towards realistic win-win
  - exotic plantations with natural forest corridors
  - benefit sharing with active involvement of local communities