



**FORESTRY AND CLIMATE  
CHANGE:  
GLOBAL UNDERSTANDINGS AND POSSIBLE  
RESPONSES**

**By**

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# Forest Carbon and Climate Change

- 2005 forest area 4,000m ha (FAO, 2006)
- 283 GtC in vegetation; 38 GtC dead wood; 317 GtC in soils (to 30cm; 787 GtC to 1m – IPCC): 70% of global terrestrial carbon; more than in the atmosphere
- Warming could result in this carbon being released to the atmosphere, i.e. forests/soils become a net source, and not a sink, of carbon emissions
- Temperature increase to cause switch could be 2-3°C, i.e. close to what the world already seems committed to
- Another effect of warming could be forest die back in e.g. Amazonia (Hadley Centre)
- Still much uncertainty, but current trend is climate uncertainties being resolved in negative directions

# Deforestation and Climate Change

- Forest conversion has contributed 30% to atmospheric CO<sub>2</sub> build up since about 1850 (loss of photosynthetic capacity, release of vegetation/soil carbon stocks)
- Forest conversion contributes about 20% of annual CO<sub>2</sub> emissions; projected deforestation over 2008-12 could add 2ppm to atmospheric CO<sub>2</sub> concentrations
- Forests play important role in the water cycle. Deforestation has impact on water resources, which will also be affected by climate change
- Deforestation contributes to biodiversity loss. Climate change will have further impact on biodiversity
- Multiple interactions between natural systems which are very difficult to predict. Systemic changes will be irreversible

# International Forestry Policy

- Forests provide global public goods; forests are the national resources of sovereign nations; forest governance requires personal and institutional integrity and extensive scientific, technical and administrative/managerial expertise
- 1945: FAO Forestry Programme
- Intergovernmental Panel on Forests (IPF, 1995-97); Intergovernmental Forum on Forests (IFF , 1997-2000); 270 proposals for action for sustainable forest management (SFM); UN Forum on Forests (2001-now) to take these forward; UNEP Natural Resources Panel
- Global Forest Convention? UNFCCC, CBD, WTO already exist
- SFM: extent of forest resources; biodiversity; forest health and vitality; productive functions of forests; socio-economic functions; legal/policy/institutional framework

# Forests and International Climate Policy

- Kyoto Protocol/Marrakech Accords: 'carbon sinks' from land use, land use change and forestry (LULUCF) activities (afforestation/reforestation/deforestation)
- LULUCF credits: forest management, cropland management, grazing land management, revegetation – limit on contribution to domestic emissions targets
- Clean Development Mechanism (CDM) credits: limited to afforestation and deforestation, only three projects under consideration by October 2006
- Short time horizon (Kyoto 2012) makes forestry projects financially unattractive
- Proposal to include credits from reduced deforestation post-2012 (Papua New Guinea)
- Proposal to receive payment for reduced deforestation (Brazil)

# Economics of Forest Carbon

- 1 ha of tropical forest: \$2-2,000 net present value from clearance plus plantation (higher figure); up to \$10,000 from carbon credits (up to \$20/tCO<sub>2</sub>; 500 tCO<sub>2</sub>/ha)
- Incorporate in carbon market? Swamp market? What about permanence? Pay for tonne-years? What about exchange rate between these and permanent tCO<sub>2</sub>?
- Separate fund for preventing deforestation?
- Include other benefits from forest functions (e.g. biodiversity)? National government could take into account national benefits (e.g. water)
- Take discussions forward in UNFCCC workshop on positive emissions to reduce emissions from deforestation

# Forest Management and Climate Change

## Mitigation

- Conservation: preventing deforestation BUT
  - Deforestation is the result of complex socio-economic causes: population growth, poverty, land tenure policies, cattle ranching, road building, logging (legal and illegal), plantations, institutional and governance failure
  - Essential processes would seem to be to establish clear (not necessarily private) property rights; provide for good governance; and offer payment for global ecosystem services
- Sequestration (reforestation and afforestation)
  - Need to take all forest functions (not just carbon-related) and socio-economic-cultural context into account
- Substitution:
  - Wood products, especially for construction
  - Bioenergy (forestry products, agricultural residues, energy crops, food crops): competition with other land uses, especially for food, need to use LCA to assess environmental benefit

# Forest Management and Adaptation to Climate Change

- Reduce vulnerability of forest system to climate change through
  - Species selection
  - Maintenance of diverse gene pools
  - Landscape management (e.g. 'fire-smart' strategies)
- Adaptation strategies need to take other socio-economic and cultural issues into account
- Adaptation and mitigation should be viewed (and publicly perceived) as complements, not substitutes
- Interact fruitfully with the UNFCCC Adaptation Fund when its mode of operation is clarified

# Conclusions: Climate Change Priorities for Forest Policies

- Reduce illegal logging
- Seek to halt deforestation by addressing its other causes
- Treat sequestration with caution and seek to maximise forest benefits of all kinds
- Carry out further research to reduce uncertainties about forest climate interactions and effective forest management mitigation and adaptation strategies
- Continue with discussions and measures to promote sustainable forest management
- All this will require the overcoming of distrust between developed and developing countries on this issue, and probably the recognition of the need for payment from the former to the latter to incentivise the conservation of global ecosystem service delivery from forests



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