Forests and some economic remarks

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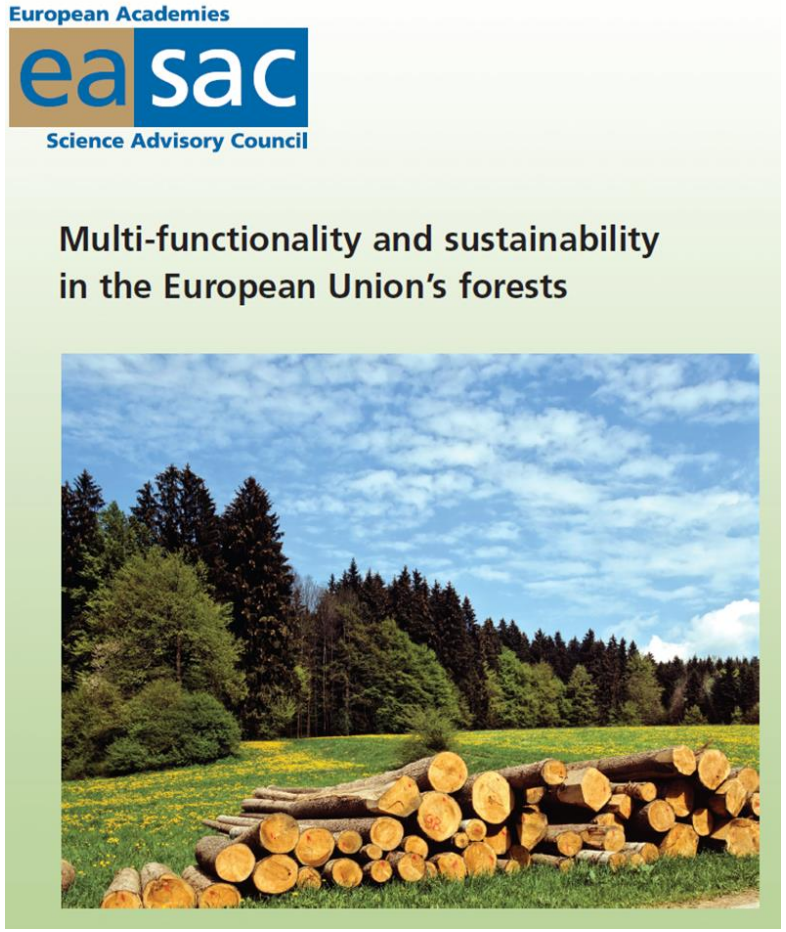
1. How to integrate forest and climate policy?
2. Forests, economics, climate change and multi-functionality



Forestry and climate change discussion:

- Is the utilization of forests “carbon neutral”?
- What is the “payback time” when forest bioenergy is used instead of fossil fuels?

Some critical remarks:

- Labeling forestry as “carbon neutral/not carbon neutral” is an oversimplification
- “Neutrality” depends on forest type, what kind of biomass is used and how it is utilized etc,
- Even utilizing harvesting residuals may increase emissions compared to fossil fuels[1]
- “Payback time” considerations assume strict climate policy that guarantees substitution of biomass for fossil fuels over long periods (>50 or 100 years)
- Forest bioenergy is inefficient: the amount of carbon emissions per unit of energy obtained is high compared to fossil fuels, solar panels, wind, etc
- The common argument that forestry is carbon neutral within larger forest land areas neglects the fact that carbon storage depends on the rotation period and volume of timber produced

1) Mäkipää et al 2015

An alternative (interdisciplinary) view to forestry and climate policy

Q1: What is the *socially optimal balance* between wood utilization and storing carbon into forests?

- Including carbon storage always changes socially optimal forest management (never “neutral”)
- For Nordic countries, studies suggest[1] that storing carbon into forests is among the cheapest methods to decrease net carbon emissions
- Given carbon price of €10-50, it would be optimal to store huge amounts of carbon in boreal forests
- In production forests carbon storage tends to *increase* rather than *decrease* long run timber supply[1]

1 Pihlainen et al 2014

An alternative (interdisciplinary) view to forestry and climate policy, cont.

Q2: How to create correct incentives in market economies?

- Carbon storage is a *positive externality* and carbon emissions from harvested wood are *negative externalities*

=> Subsidize carbon storage and tax (all) carbon emissions:

"Cleaner earns, polluter pays" –principle

- Subsidizing carbon storage is applied in New Zealand and Canada but **EU is behind**
- Unclear whether the immediate oxidation principle of IPCC (and applied in EU) represents a fruitful basis to create correct incentives in forestry and for utilizing wood

Forests and climate change in the EU -policy

- EU bioeconomy policy: a strong boost to use forests in energy production
- Does not guarantee any balance between carbon storage and timber harvesting

- Some other critical features of the EU -policy setup
  1. How are the **country specific forest reference levels** defined?
     - if reference levels are loose with respect to BAU, countries have incentives to transfer emissions from ETS and non-ETS sector to LULUCF without any real decrease in *net* carbon emissions
     - countries should not benefit from high BAU carbon storage –only **additionality** matters
  2. Should be clarified what are the consequences if countries do not meet their forest reference levels

The worst case: countries use **public subsidies** for transferring emissions from non-ETS sector to LULUCF **without any real decrease in net emissions**

Forest management, economics and multi-functionality

- The present trend: single species Norway spruce plantations and MSY
- Economically sensible wood production ***is not based on max m^3***; prices, costs, interest rates and forest owners' objectives must be noticed
- Economically sensible wood production should additionally be adapted to **climate change risks** and multi-functionality
- Many studies[1] have found that ***mixed species heterogeneous forests*** provide higher level of ecosystem services and multi-functionality
- Earlier it was thought that continuous cover forestry (CCF) is not economically viable in boreal forests but newer research[2] suggests quite the contrary
- Strong economic/ecological reasons to diversify forest management methods

1) Gramfelt 2012 et al, Gauthier et al 2015
2) Tahvonen and Rämä 2016

Some problems in forest research

- research on forestry and forest environment should be interdisciplinary
- ecology, social sciences (incl. economics), etc
- however, interdisciplinarity is still in its early stage in forest research
- some special problems in Finland and Sweden:
  forest research needs reliable ecological models on forest growth
  In Sweden: HEUREKA modelling system
  In Finland: MOTTI modelling system
  Problems: HEUREKA, not based on studies published in scientific journals
  MOTTI, the same problem and the system is not generally available
- These problems seriously slow up the development in neighboring fields
- Forest research should increase interdisciplinarity and follow more strictly general scientific principles