

Peat soils as hotspots in agricultural climate policies

Hans Joosten, Greifswald University, Brussel 21-09-2011

In living peatlands (mires): Plant production > decay, peat accumulates, positive C-balance

Peat accumulates during thousands of years and stores concentrated carbon in thick layers

Peatlands are found in almost every country. Worldwide: 4 million km². Also important in the EU

The importance of peatlands for climate change mitigation (and adaptation!) has long been overlooked

Natural peatlands remove CO₂ and emit CH₄. In balance, they are climatically neutral

Their importance lies in their carbon *stock*: peatland is *peat*-land and peat is largely carbon

Peatlands are the most space-effective carbon (C) stocks of all terrestrial ecosystems

In the boreal zone peatlands contain 7 x more carbon per ha than other ecosystems, in the tropics 10 x

While covering only 3% of the World's land area, peatlands contain > 500 Gt of carbon in their peat

This is equal to all terrestrial biomass, and 2 times the carbon stock in the total forest biomass of the world

They hold *in average* per ha even twice the carbon content of the mammoth forest in California

When drained, the peat oxidizes and peatlands become vigorous sources of carbon dioxide (and nitrous oxide)

Globally peatlands have turned from C-sink to C-source

Globally, degraded peatlands emit 2 Gtons CO₂ yr⁻¹

0.3 % of the land surface is responsible for 6 % of the total global anthropogenic CO₂ emissions...

Main peatland emission hotspots: SE Asia and EU

Drained peatland subsides, becomes wetter and requires deeper drainage, leading to further subsidence: ... the "*devil's cycle*" of peatland utilisation...

...The Netherlands: bogged down by 1000 yr of peatland drainage, now half the country below sea level...

Rapid soil degradation in more continental climates: after 30 years no agriculture possible anymore

Drained peatlands are the environmental black sheep of agricultural land use...

...because conventional peatland agriculture imitates dryland agriculture...

...although draining, plowing and fertilizing of peatland are the best ways to increase emissions.

The most important peatland emitter worldwide is agriculture...

In the EU, the 2% arable fields on peat soil emit almost 10 times more than the 88% on mineral soil: HOTSPOT

One hectare of drained peatland emits per year as much CO₂ as flying 3 x around the globe!

Every 10 cm deeper water level leads to 9 ton (!) extra CO₂ emission per ha per year

Currently peatlands are deeper drained for cultivating "biofuels", all over the world

Our home-made scandal: Mays on peatland for biogas: biofuel is climatically accounted, peat carbon losses not

From a climate point of view it is better to burn the peat directly than to cultivate biofuels on drained peatland

...biofuels from drained peatlands emit much more CO₂ than burning coal...

EU money maintains these practises

- Direct payments maintain drainage of peatland even without utilisation of biomass
- Agri-environment schemes stimulate organic agriculture on deeply drained grassland
- Renewable Energy Law fosters using drained peatland for bio-energy crops

→ EU supports land use on drained peatland and frustrates sustainable land use options

We must get out of this devil's circle and develop another agriculture: *paludiculture!*

Paludiculture is agriculture on wet/rewetted peatlands

Paludicultures reduce peatland emissions and produce renewable biomass resources

Biomass from rewetted peatlands avoids much more emissions than other biofuels!

Paludiculture:

- Cheap, effective way to reduce GHG emissions
- Land exploitation with minimal soil degradation
- Rehabilitation of degraded land
- Employment in rural area
- Raw materials for energy and industry
- Energy-political autarchy
- Better landscape hydrology and mesoclimate
- Decreased nutrient emissions to the seas
- Habitats for rare wetland species
- Improved perspectives for (eco)tourism
- Prevention of peatland fires

Most paludicultures can compete with normal drainage based agriculture on similar soils

But substantial market distortion because of agricultural subventions

→ recognition of paludiculture as agriculture

Needed:

- HOTSPOT approach for peat (organic) soils
- Cf. UNFCCC, LULUCF, REDD+, IPCC
- EU: 40,000 km² drained agriculture on peat
- Strengthen cross-compliance requirements to protect peat soils
- Target Pillar I support towards paludicultures
- Agri-environmental schemes for raising water levels (> 20 cm below surface)
- Longer term agreements to secure peatland rewetting

Needed:

- Investment grants for
 - land reallocation and hydrological restructuring,
 - development/acquisition of adapted machinery
 - development of production lines
 - product placement...
- Agricultural consultation for peatland use
- Research
- Ban on ploughing of grassland on peat

Very positive for climate. But also for water management and biodiversity

PEATLANDS MUST BE WET!