Fact book

for UNFCCC policies on peat carbon emissions

WETLANDS
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Contents

1 Introduction

Peatlands are wetlands with a peat layer (soil). Their huge carbon stock is attributable to the thick layers of peat (up to 25 meters) that are conserved by the wetness of the substrate. This peat largely consists of organic material with a carbon content of over 50%.

All over the world, precious peatland ecosystems, with a unique nature and beauty are degraded and destroyed. Peatswamp forests in Indonesia are drained and logged; tundra peatlands are affected by global warming and mountain peatlands like in the Himalayas are subject to overgrazing and mining. Contrary to forests, few people recognize or are even aware of these areas. Even less people know that these areas, that cover only 3% of the land surface of the Earth, contain twice as much carbon as all the world's forest biomass. Carbon that under normal conditions would remain stored for infinite times and eventually would turn into coal, is now released at an alarming rate, causing around 6% of all global carbon dioxide emissions. These emissions remain largely unreported. And where reported, they are excluded from the national emission accounts. As a result there are so far no incentives to protect and restore peatlands; a disaster for climate, biodiversity and people.

Wetlands International is dedicated to spread this message about this disaster and advocates that UNFCCC will provide incentives to address the loss of the world's peatlands. As peatlands are unique ecosystems, addressing the emissions generates unique questions. This publication is meant to provide answers on the emissions from peatlands and formulates some policy approaches to addressing these issues.

The publication is produced jointly by Wetlands International and by the University of Greifswald.

2 Global overview of peatland areas

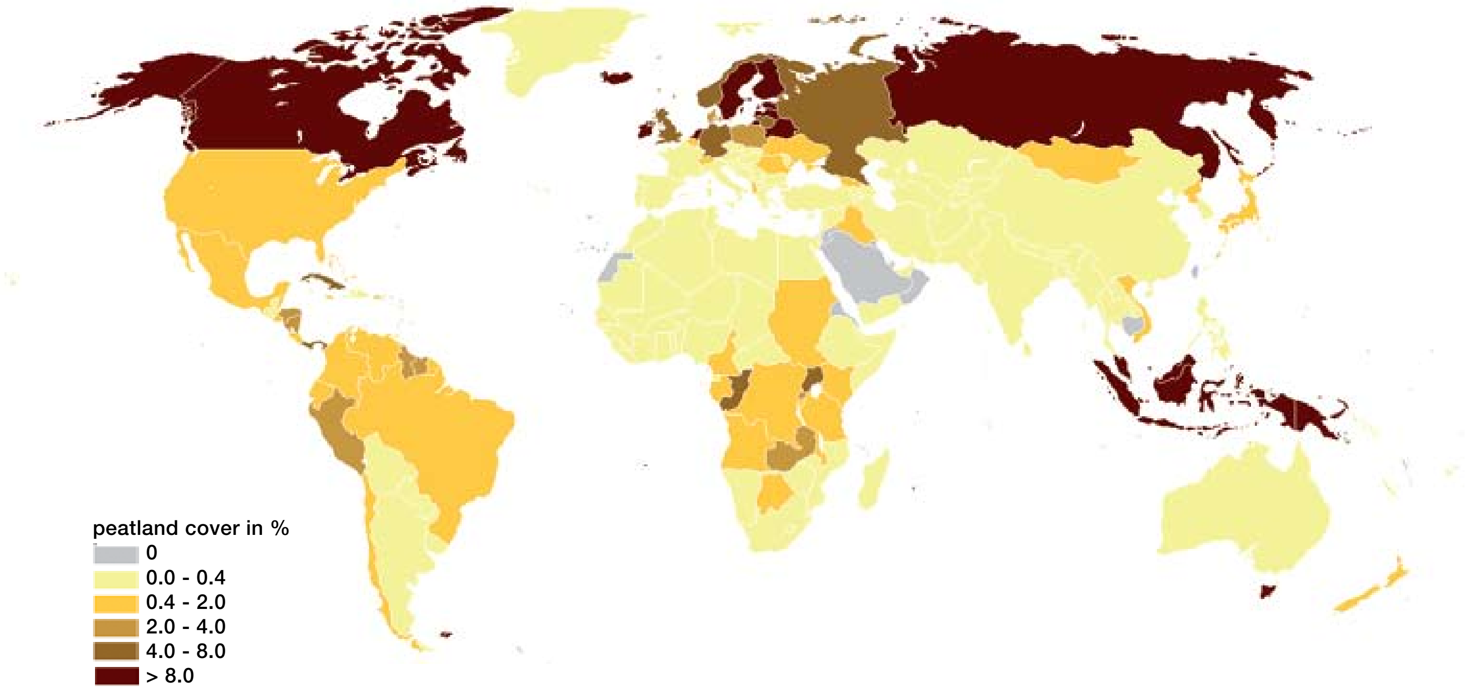

Figure 1. Peatland cover per country (*source: Wetlands International and Greifswald University, 2009. The Global Peatland* CO_2 *Picture*)

Peatlands are found in 175 countries of the world, but are especially abundant in cold (i.e. boreal and sub-arctic) and wet (i.e. oceanic and humid tropical) regions.

Table 1. Distribution of peatlands over the continents in 2008 (source: *The Global Peatland* CO_2 *Picture, Wetlands International and Greifswald University, 2009*)

Continents	Total area in 10^6 km^2	Continent in % of global land area	Peatlands in km^2	Peatland area in % of area in continent	% of global peatland area
Africa	30.37	20.3	130,126	0.4	3.4
Antarctica and the Subantarctic Isles	13.71	9.2	15,871	0.1	0.4
Asia	43.81	29.3	1,545,709	3.5	40.5
Australasia (Oceania)	9.01	6	72,845	0.8	1.9
Europe	10.4	7	504,608	4.9	13.2
Americas	42.33	28.2	1,544,394	3.6	40.5
Total	**149.64**	**100**	**3,813,553**	**2.5**	**100**

Table 2. Top-20 for peatland area *(source: The Global Peatland CO_2 Picture, Wetlands International and Greifswald University, 2009)*.

	Country/region	Peatland area (km^2)
1	Russia – Asian part	1,176,280
2	Canada	1,133,926
3	Indonesia	265,500
4	Russia – European part	199,410
5	USA (Alaska)	131,990
6	USA (lower 48)	91,819
7	Finland	79,429
8	Sweden	65,623
9	Papua New Guinea	59,922
10	Brazil	54,730
11	Peru	49,991
12	China	33,499
13	Sudan	29,910
14	Norway	29,685
15	Malaysia	26,685
16	Mongolia	26,291
17	Belarus	22,352
18	United Kingdom	17,113
19	Germany	16,668
20	Congo	15,999
	Global total	**3,813,553**

The regions with the largest peatland areas and peat carbon stocks include northern countries like Russia, Canada, USA (Alaska!), Finland, Sweden, Norway, and their southern antipodes (Falklands/Malvinas, Chile), next to tropical countries (Indonesia, Brazil, Peru, Papua New Guinea, Malaysia, Dem. Rep. of Congo, Uganda). Other notable occurrences are in countries in the temperate zone, incl. Belarus, United Kingdom, Germany, Poland, and Ireland.

3 Global overview of peat-carbon stocks

Peatlands have carbon stocks that greatly exceed those of other terrestrial ecosystems. Even the Giant Conifer Forest in the Pacific West of North America – with the highest trees in the World – reaches per ha only half of the carbon stock that peatlands hold in average.
Peatlands constitute the largest and most concentrated reservoir of carbon (c) of all terrestrial ecosystems, storing worldwide an estimated 550 Gt (1 Gt = 1 Gigatonne or 109 metric tonnes) of c in their peat. This is equivalent to 75% of all atmospheric c, equal to all terrestrial biomass, and twice the carbon stock in the forest biomass of the world (parish et al. 2008). Of this 452 Gt carbon, almost two thirds is stored in canada (155 Gt) and russia (138 Gt).

Active peat mining in Belarus (source: *Marcel Silvius, 2009*)

Table 3. Top-20 for peat-carbon stock (source: *The Global Peatland* CO_2 *Picture, Wetlands International and Greifswald University, 2009*)

	Country	Peat carbon stock 2008 (Mton C)
1	Canada	154,9
2	Russia Asian part	117,6
3	Indonesia	54,0
4	Russia European part	19,9
5	USA (Alaska)	15,4
6	USA (lower 48)	13,6
7	Papua New Guinea	5,9
8	Brazil	5,4
9	Malaysia	5,4
10	Finland	5,2
11	Sweden	5,0
12	China	3,2
13	Norway	2,2
14	Germany	2,0
15	Venezuela	1,9
16	Sudan	1,9
17	United Kingdom	1,7
18	Congo	1,6
19	Mexico	1,4
20	Uganda	1,3
	Global total	**445,691**

Although for most countries indicative data on peatlands are available, exact figures on peatland stocks are still hard to give. The available information is certainly much less than that for forest carbon stocks. This is a direct result of the lack of attention for these carbon stocks so far. It is also a result of the fact that remote sensing techniques to determine peat depth over large areas are not well developed and laborious field work is still necessary.

4 Global overview of peat-carbon emissions

When peatlands are drained, the peat is no longer conserved. It decomposes, which leads to vigorous releases of carbon dioxide. It is estimated that the total carbon emissions from degraded peatlands currently amount to almost half of the worldwide emissions from Land Use, Land Use Changes and Forestry (LULUCF) and to 5% of the total global anthropogenic carbon emissions.

The global CO_2 emissions from drained peatlands have strongly increased since 1990. Leaving aside emissions from peat extraction and fires, global CO_2 emissions from drained peatland have increased from 1,058 Mton in 1990 to 1,298 Mton in 2008. This 240 Mton increase is equivalent to > 20% of the 1990 emissions. Since 1990 peatland emissions have increased in 45 countries, of which 40 developing countries. A more than 50% increase in emissions was found for: Papua New Guinea, Malaysia, Burundi, Indonesia, Kenya, Gabon, Togo, Trinidad and Tobago, Dominican Republic, Colombia, Rwanda, Brunei,

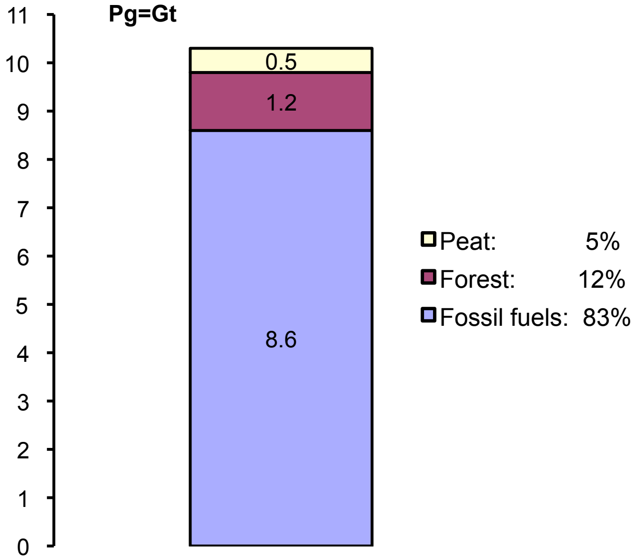

Figure 3. Carbon emissions in 2008. (Sources: peat (*Wetlands International and Greifswald University, 2009. The Global Peatland CO_2 Picture*); forest (*van der Werf, G.R., et al, 2009. CO_2 emissions from forest loss*); fossil fuels (*EDGAR database, JRC/PBL, 2009*).

Figure 4. Global hotspots of peat carbon emissions *(source: Hooijer, A. in press.)*

Ethiopia, and Guatemala. These top-growers include with Indonesia, China, Malaysia and Papua New Guinea some of the top peat emitters in the World.

As a result of geo-political and economic changes, peatland drainage has largely stopped in many annex 1 countries since 1990. Emissions from already drained peatlands, however, continue to be large. Annex 1 countries are responsible for about 0,5 Gton of CO_2 emissions. The EU is with 174 Mton the second largest emitter after Indonesia (500 Mton) and before Russia (161 Mton).
Overall, Annex 1 peat emissions seem to have decreased from 655Mton in 1990 to 492 Mton in 2008; i.e. a decrease of ~25% of emissions compared to 1990. Part of these reductions, however, only emerge because peatlands abandoned since 1990 have wrongly disappeared from the reporting, especially in Eastern Europe. Peat extraction activities of the World's largest peat extractor (Russia and other Former soviet states) have substantially decreased (but currently show again an upward trend).

Table 4. Top-25 for drainage related carbon dioxide emissions from peat degradation for 2008 (fires excluded!) (source: *The Global Peatland CO_2 Picture, Wetlands International and Greifswald University, 2009*)

	Country/area	**Emissions from degrading peat 2008 (Mton CO_2/a)**
1	Indonesia	500
2	Russia European part	139
3	China	77
4	USA (lower 48)	67
5	Finland	50
6	Malaysia	48
7	Mongolia	45
8	Belarus	41
9	Germany	32
10	Poland	24
11	Russia Asian part	22
12	Uganda	20
13	Papua New Guinea	20
14	Iceland	18
15	Sweden	15
16	Brazil	12
17	United Kingdom	10
18	Estonia	10
19	Ireland	8
20	Lithuania	6
21	Netherlands	6
22	Norway	6
23	Vietnam	5
24	Ukraine	5
25	Zambia	5
	Global total	**1,298**

5 Causes behind peatland emissions

Emissions from the non-annex 1 countries of southeast Asia increased considerably since 1990 due to large scale logging of peatswamp forests and drainage for plantations.
The largest hotspot of peatland carbon emissions with some 600 Mton carbon dioxide emissions per year is southeast Asia. The total emissions of 1.3 Gton do not include the considerable source of emissions caused by peat fires, regularly occurring in south-east Asia. These differ enormously from year to year as a result of differences in rainfall and changes in land management. Estimates for peatland fire emissions from southeast Asia vary from approximately 400 Mt/CO_2-eq/yr (Van der Werf et al. 2008) to 1400 mt (Hooijer et al. 2006) of carbon dioxide per year. In this booklet we follow the conservative value. Other hotspots, with in total also around 1000 mton carbon dioxide emissions per year together, are central europe, northeast China, Florida and the US midwest with adjacent Canada.

Annex 1 countries are responsible for emissions of around 900 mton a year.

Table 5. Global emissions drained peatlands. (*source: The Global Peatland CO_2 Picture, Wetlands International and Greifswald University, 2009*)

Emissions drainage for agriculture	Emissions drainage for forestry	Emissions drainage for peat extraction	Emissions drainage for other purposes	Emissions non-forested peatland	Total degrading peatland area 2008	Emissions peat extracted in 2008	Total emissions degrading peat 2008
Mton CO_2/a	km^2	Mton CO_2/a	Mton CO_2/a	Mton CO_2/a	km^2	not included	Mton CO_2/a
1,086	129	21	16	1,106	426,381		1,298

Table 6. Drainage related emissions SE Asia vs other areas *(source: The Global Peatland CO_2 Picture, Wetlands International and Greifswald University, 2009)*

Cause	CO_2 emissions	Total CO_2 emissions
Unit	Ton CO_2 ha-1 a-1	Mton a-1
Drained peatlands in SE Asia	50	568
Drained peatlands outside SE Asia	25	730
Peat fires in SE Asia		400
Total *		**1,698**

** excluding emissions from peatland fires outside SE Asia and from peat extraction*

6 Measurability of peat-carbon stocks and emissions

The current global peatland carbon stock is around 450 Gtons. Peatlands cover an area of 400 million ha. Of this area about 65 million ha is drained, leading to a total annual CO_2 emission of 2 Gton CO_2 (see table 5). Pristine peatlands generally sequester net CO_2.

Peat carbon sequestration is a matter of a delicate imbalance of production and decay and only a small proportion of the peatland biomass enters the permanently waterlogged zone and becomes peat. The delicate balance causes peatlands to easily become carbon emission sources following human interventions, especially drainage. Lowering of the water table in peatlands stimulates decomposition. The oxygen allows aerobic decomposition to take place, which is fifty times faster than anaerobic decomposition. CO_2 emissions from drained peatlands generally increase with increasing drainage depth and warmer climates. For most countries of the world, only indicative data on peatland area and peat carbon stocks exist. With good soil maps and default values about carbon content and average depths, reliable estimates can be made. More advanced stock inventory is except for some countries not available. Any policy demanding a credible determination of stocks is therefore costly and time consuming. In fact, field research is necessary to measure the depth of the peat layer. To improve the database the following steps are required:

- Adopt global standard definitions or “peat” and “peatland”. At present the definitions vary strongly between countries, with time, and even between peatland types and drainage level. In canada, for example, the thickness criterion is 24 inches (60 cm) for fibric sphagnum peats and 16 inches (40 cm) for other types of peats. In Germany, in former times “peatlands” only had to have 20 cm of peat, whereas currently a minimum thickness of 30 cm is required.
- Adopt global standards for peatlandmapping. Current inventories consider peatlands of various minimum extent, e.g. larger than 3, 10, or 100 ha. the Fao/ UNesco soil map of the World (sm W; 1: 5,000,000, 1974 - 1981) from which most peatland areal data in tropical countries are derived, only uses associations of soil types, from which the peatland occurrences are not sharply deducible.
- Use remote sensing techniques to assess the regional presence of peatlands and field mapping to assess the thickness and type of peat.
- Recognize the variety of peatlands. Often overlooked peatlands include mangroves, salt marshes, paludified forests, cloud forests and elfin woodlands, paramos, dambos (and their equivalents in other languages like “bas-fonds”, “marigots”, “inland valleys”, “bolis”, “fadama”, “vleis”, “bani”, “mapani”, “mbugas”, …), and cryosols.

Assessment of emissions

The Bali Action Plan calls for climate mitigation actions that are measurable, reportable and verifiable (MRV). The development of proxies for easy assessing peatland emissions is rapidly progressing. As emissions are largely determined by water levels and prevailing vegetation, the use of vegetation, water level (also via remote sensing) and subsidence as indicators of area-wide peatland emissions is very promising. Sufficient information is already present for the boreal zone and temperate europe, similar approaches for se asia are being developed. These will enable contracting parties to provide reliable and verifiable figures on their national peatland emissions and therefore allows inclusion of peatland conservation and rewetting in a post-2012 climate framework.

Whereas adequate techniques exist to measure greenhouse gas fluxes in detail (chamber method, eddy-covariance), these methods are too labour intensive and expensive to assess and monitor emissions over many and large areas.

Voluntary Carbon Standard

The VCS Association has developed guidance for Peat Rewetting and Conservation (PRC) projects and for other AFOLU projects located on peatlands.

Activities that verifiably and permanently reduce net GHG emissions from peatland or increase peat carbon stocks would be eligible under the VCS as PRC projects, or as AFOLU projects on peatland. Activities that may reduce net GHG emissions but actively lower the water level would not be eligible.

Four broad categories of activities are considered:

1. Rewetting (or reducing drainage depth) of drained peatland
2. Conservation of undrained non-forested peatland
3. AFOLU activities carried out on peatland
4. Avoided peat mining

The PRC guidelines are currently under peer review from a pool of scientific/technical peat experts, peatland project developers, and AFOLU validators/verifiers, with the goal of ensuring that the PRC guidelines are scientifically sound, workable in practice, and provide clear guidelines for validators.

7 Carbon sequestration in peatlands

In all terrestrial ecosystems, plants convert atmospheric CO_2 into plant biomass that after death rapidly decays under the influence of oxygen. In peatlands, part of the dead plant material soon arrives in a permanently water logged, oxygen poor environment, where the rate of decay is extremely low. Approximately 5–15% of the produced peatland biomass is sequestered in this way and (under natural conditions) for ever conserved. Peat accumulation rates are dependent on climatic, hydrologic, and hydrochemical conditions. In general, accumulation increases from nutrient rich to nutrient poor, from polar to equatorial, and from continental to oceanic conditions. the rate of carbon accumulation (lorca) is generally in the order of magnitude of 0,1–0,4 ton c ha-2 yr-1 in the subarctic, boreal and temperate zone, and may reach 1–2 ton c ha-2 yr-1 in temperate and tropical swamp forest peatlands.

The total present-day rate of C sequestration in the pristine peatlands of the World is less than 100 Mtons C y-1.
If all the world's peatlands would be restored by ending drainage, this amount would increase with 10 – 20 %. The most important effect of rewetting degraded peatlands is, however, not the re-installment of carbon sequestration, but the avoidance of carbon emissions from peat oxidation.

(source: *Argentina 2006, Hans Joosten*)

8 Permanence of carbon storage in peat

Without exploitation the peat carbon would remain in the peatland store virtually forever. part is on the long run remobilized by tectonic processes and severe climate change (Ice ages!), another part changes into lignite and later coal. the latter is illustrated by the oldest peat being 10 million years old, whereas the youngest lignite and coal are only 100,000 years and 20 million years old, respectively.

Here lies also the fundamental difference between ‘biomass’ fuels and ‘fossil’ fuels (like peat and coal). by burning biomass fuels (like wood and straw), organic material is oxidized that anyhow would have been oxidized by decay after the plant’s death. In case of biomass combustion, humans consume the energy, whereas in case of natural decay microbes consume the energy provided by oxidation. In both cases the same amount of CO_2 ends up in the atmosphere, only the pathways are different.

Fossil fuels, on the contrary, would – without exploitation – remain in the long-term store and nót end up in the atmosphere as CO_2. By peat combustion and oxidation, carbon is oxidized that otherwise would have remained stored for thousands and thousands of years. This applies whether the peat is 10 or 1,000 or 100,000 years old. Not the age determines whether something is ‘fossil’ or ‘biomass’, but the natural destiny of the material. Similar to coal, lignite (browncoal) or oil, the *natural destiny* of peat carbon is to remain stored.

The permanence of the peat carbon store is clearly illustrated in natural coalification (see figure 6). Whereas in the initial process of peat formation 85-90% of the original biomass carbon stock is lost, most of the residual carbon remains during the further coalification process that changes peat – over millions of years – into lignite, coal and eventually anthracite.

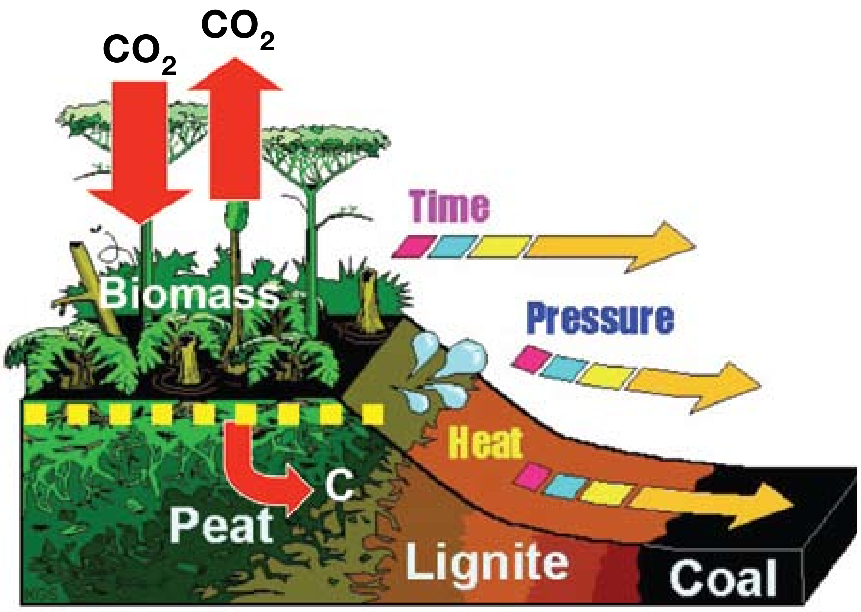

Figure 5. The difference between “biomass” and “fossil”: growing plants sequester CO_2 in their bio-mass (left downward arrow). Dead biomass rapidly decomposes and returns as CO_2 into the atmosphere (right upward arrow). In case of peat formation, a part of the biomass is, however, conserved by waterlogging and remains in the peat carbon store infinitely (curved arrow). Over time it may change into lignite and coal.

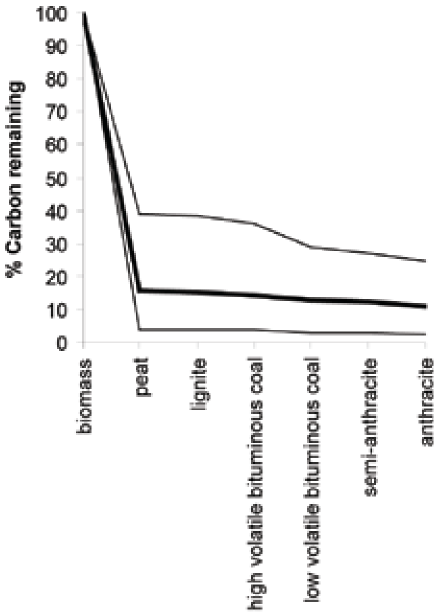

Figure 6. Carbon remaining during the fossilization of biomass (modified after Dukes 2003).

9 Methane (CH_4) and Nitrous Oxide (N_2O) emissions

Next to sequestering net CO_2, peatlands may also emit methane (CH4) and N_2O.
A post-2012 framework aiming at peatland rewetting must therefore also address associated methane emissions.

The scientific database for methane emissions is much larger than that for CO_2 or N_2O and recently several high quality reviews on the subject have been published (Couwenberg et al. 2009, Lay 2009, Saarnio et al. 2009).

The overall balance is that peatland restoration reduces the emissions of greenhouse gasses into the atmosphere.

The annual mean water level is a surprisingly good indicator for methane emissions, but at high water levels the cover of aerenchymous shunts (gas conductive plant tissue) becomes a better proxy. Ideally, both water level and cover of aerenchymous shunts should be assessed to arrive at robust estimates for methane emissions (Wetlands International, Couwenberg, J. Greifswald University, August 2009)

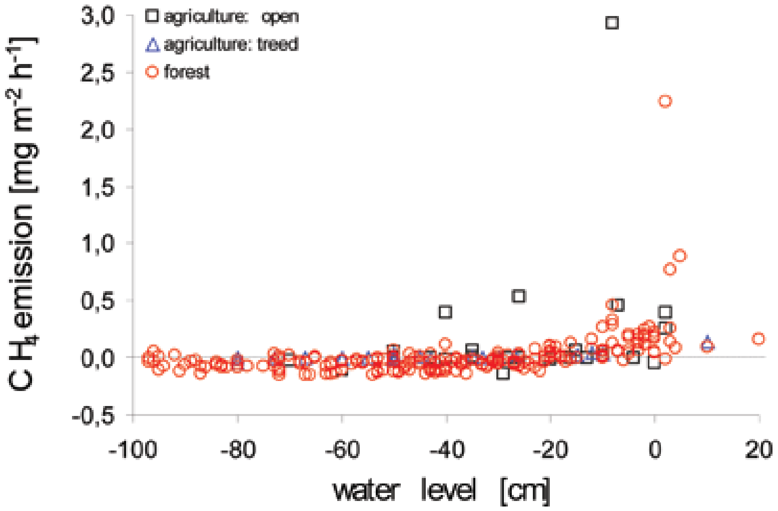

Figure 7: Hourly methane emissions from tropical peatswamp soil in relation to water level. (source: Couwenberg et al. submitted).

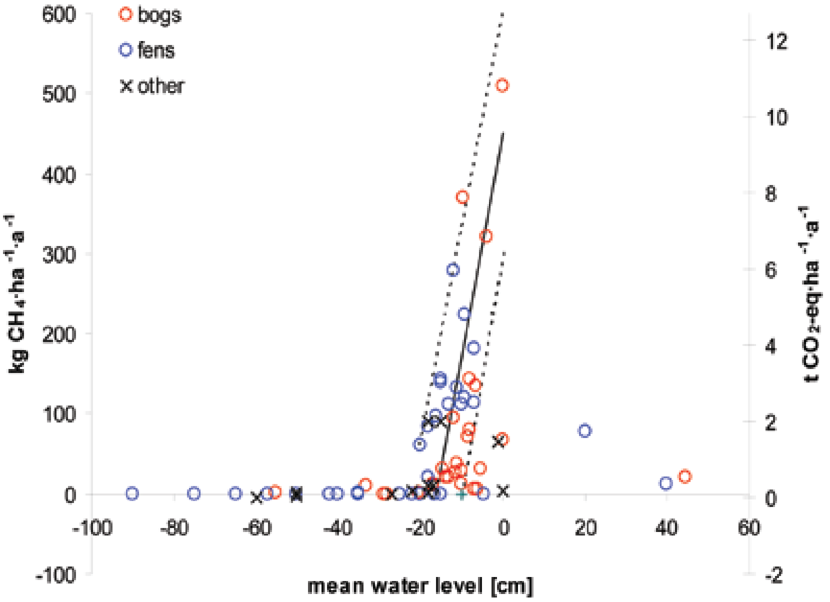

Figure 8: Hourly methane emissions from (Δ) boreal and (□) temperate sites. Note the fivefold difference in scale. (source: Couwenberg et al. submitted)

The overall balance is that peatland restoration reduces the emissions of greenhouse gasses into the atmosphere.

The emission of CH4 strongly depends on the water level, is virtually zero at water levels lower than 20 cm below surface, but rises rapidly with higher water levels. CH4 emissions from pristine tropical peatlands seem to be 3 times lower than those from temperate peatlands.
N_2O emissions in the temperate zone are restricted to mean water levels below -20cm, with emissions negligible in case of pristine peatlands. In the tropics trends seem similarly erratic but without clear correlations with site parameters. An important factor for N_2O emissions is land use: fertilized peatlands emit part (in the temperate zone 2 – 9 %) of the applied fertilizer N as N_2O.

In case of peatland drainage, CH4 emissions decrease and CO_2 and N_2O emissions from the peat increase. As the latter dominate, the combined effect leads to (often much) larger climate relevant emissions.

In case of peatland rewetting, the opposite occurs: CO_2 and N_2O emissions strongly decrease. CH4 emissions increase, but are generally of much less importance. Only in exceptional cases (flooding of crops), CH4 emissions after rewetting may increase to such an extent, that the effect of CO_2 and N_2O emission reduction is annihilated. This effect is, however, only of short duration, and on the mid- and long-term, rewetting of peatlands always leads to a net reduction of climate relevant emissions.

Table 7. Annual nitrous oxide emissions from peatlands in tropical SE Asia and in temperate Europe. *(source: Couwenberg et al. submitted)*

	Land use	**g N_2O m^{-2} a^{-1} mean (range)**
Tropical SE Asia	Drained agricultural land (fertilised), n = 8	14.28 (1.12 – 40.7)
	Drained, open vegetation (abandoned, not fertilised), n = 5	0.11 (-0.17 – 0.63)
	Forested (drained and undrained peatswamp, agro-forestry), n = 9	0.54 (-0.08 – 2.10)
	Paddy, n = 5	0.10 (-0.06 – 0.32)
Temperate Europe	Drained agricultural land (fens/fertilised), n = 80	0.97 (-0.05 – 8.86)
	Forested (drained and undrained), n = 14	0.57 (0.04 – 2.69)
	(Semi-)natural (incl. rewetted), n = 23	0.10 (-0.01 – 0.27)

10 Expected development of peat-CO_2 emissions

In recent times large changes have taken place with respect to peatland use and degradation. as a result of geo-political and economic changes, expansion of peatland drainage has largely stopped since 1990 in the annex 1 countries, whereas also the activities of the World's largest peat extractor (russia and other Former soviet states) have largely collapsed. Although the overall emissions from peatland drainage in Annex 1 have decreased with ~25%, emissions from already drained peatland are nevertheless very significant. The activities of the World's largest peat extractor (Russia and other Former Soviet States) have largely collapsed, although currently showing an upward trend again. In the tropics, however, peatland drainage has in the same time massively increased. Very recently, a renewed attention to using peat for energy and peatlands for crop production can be observed in all parts of the world as a result of the demand for energy, land and food. predicting future land use developments by projecting past trends is under these circumstances a crude simplification of actual developments. the increase in emissions in southeast asia (fig. 9) is caused by progressive deforestation and drainage of peatlands. the projected decrease after 2020 ('likely' scenario) is caused by shallower peat deposits being depleted. the stepwise pattern of this decrease is an artefact caused by using discrete peat thickness classes (0.25m, 0.75m, 1.5m, 3m, 6m, 10m). this trend is, however, only dealing with southeast asian peatlands. For the vast boreal peatlands in russia, scandinavia and canada, the expectations are different. the current, direct threat is less, but the maintenance of these huge carbon stocks is by no means secured.

The technical potential exists to drain and exploit up to 90% of the World's peatland area and peat stock, which would lead to an emission of 1,800 Gtonnes of CO_2: an amount equal to 60 times the global annual CO_2 emissions! the annual emission will strongly depend on how the peatlands will be used.

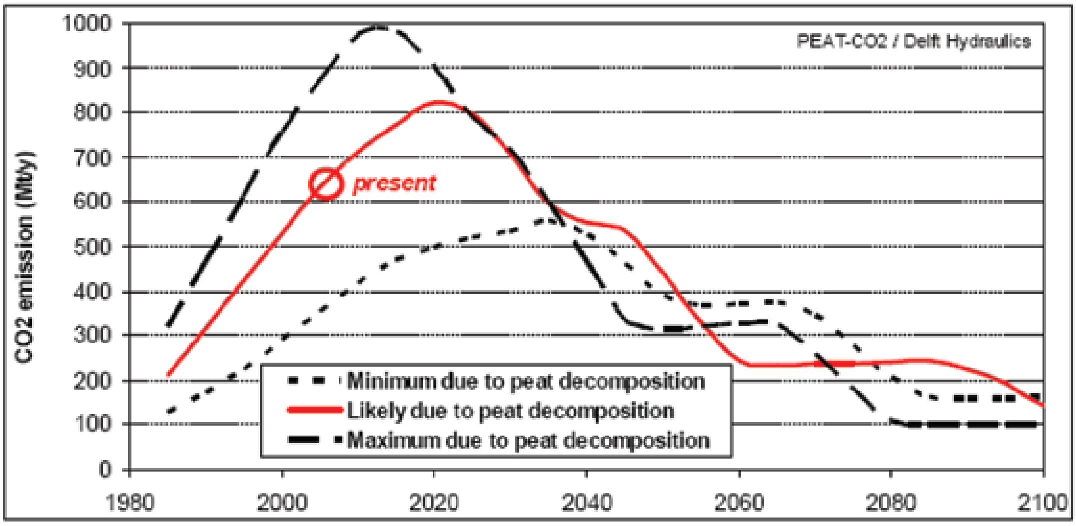

Figure 9. Historical, current and projected CO_2 emissions from peatlands in Southeast Asia, as a result of drainage (fires excluded) *(source: Hooijer, A. in press)*

Concrete (economic) use will strongly depend on:

- Local fuel availability, with countries with less other local resources faster changing to peat as a fuel.
- The general scarcity of fuels and “clean” fuels in particular. The development of the modern peat fuel industry in sweden and Finland, for example, is directly attributable to the “oil crisis” of the 1970s. Currently renewed expansion of peat fuel can be observed in Finland and sweden, Indonesia (local fuels), russia (local fuels to save oil and gas for export), whereas new plans for extracting peat fuel arise as an alternative for more dirty (sulphur!) local coal or nuclear power (e.g. ontario).
- Inclusion of peat carbon stocks in GHG accounting and the associated “attractiveness” of peat soils for biofuel crop (incl. wood) cultivation. Currently the use of drained peatland soils for biofuel production is observed all over the world, even though in most cases those biofuels lead to 3 – 9 times more CO_2 emissions per energy unit produced than burning coal…
- Climate change, leading to other land use options for peatlands. Currently arable peatland agriculture is largely restricted to the temperate to tropical zone and largely absent from the boreal to arctic zones. With (substantial) climate change the vast boreal zone will become more suitable for arable agriculture and more profitable for forestry. In the North, the melting of permafrost may lead to both a increase in carbon sequestration rate through higher plant productivity and to an increased emission of methane (through more humid conditions). Human activities (oil/gas exploration and exploitation) may lead to an acceleration of permafrost degradation.

11 **Peatland restoration**

Peatland restoration
A key aspect of efforts to manage and restore peatlands is to re-establish the hydrology, as keeping peat soils wet stops them from decomposing further, thereby avoiding enormous CO_2 emissions. Peatlands can be rewetted by blocking drainage canals and erosion gullies. A second major element is to restore the vegetation cover. A layer of vegetation is crucial for keeping the peatsoil wet and preventing further degradation. In some cases, rewetting sets the conditions for revegetation. In other cases, nature needs to be helped by replanting.

Blocking of canals in Sebangau National Park, Borneo. (source: *Marcel Silvius, 2008*)

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Mission:

To sustain and restore wetlands, their resources and biodiversity for future generations.

Peatland degradation fuels climate change

3% of the world surface is covered with peatswamps.

450Gt of carbon is stored in peatlands, this is almost as much carbon as all accessible fossil coal reserves (585 Gt), twice as much as all global forest biomass, and 75% of allatmospheric carbon.

2 Gt CO_2 is emitted every year due to rapid peatland loss.

Nothing is done under current climate policies to stop these emissions.

Wetlands International calls for UN-FCCC policies that provide incentives to reduce carbon emissions from peatland loss.

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