

# Accounting for peatland hotspots

## Introduction

Peatlands (~organic soils) worldwide store twice as much carbon as all forest biomass, although they cover only a tenth of the land. The drainage of peatlands, for forestry and agriculture, leads to the oxidation of this carbon and increases their vulnerability to peat fires, leading to huge emissions of greenhouse gases.

## Hotspots for mitigation

Emissions from drained peatlands currently constitute 5% of total global anthropogenic greenhouse gas emissions, although drained peatlands only occupy 0.4% of the total land area in the world. For several developed and developing countries peatland emissions constitute a significant part of their total emissions. This fact is often overlooked, certainly when peatland only occupies a small area. Over 50% of the total worldwide GHG emissions from peatlands are caused by only 2 countries, whereas 11 countries cover 80% of the total emissions, 19 countries 90% and 27 countries 95%. For some countries emissions from organic soils are much larger than emissions from fossil fuels and cement together (see figures on following pages). **To optimally use the mitigation potential of the land (Agriculture and LULUCF = AFOLU), countries should treat peatland as *emission hotspots*.**

## Rewetting and sustainable use to reduce emissions

- The highest priority is to place a ban on draining new peatlands, in order to prevent peatland emissions from sky-rocketing, as emissions from newly drained land add to continuing emissions from earlier drained peatland.
- To reduce emissions from peatlands, drainage has to be halted and peatland has to be rewetted. Rewetting can focus on the recovery of the

'original' ecosystem, but also on the maintenance of productive land use under wet conditions (paludiculture). There is considerable experience with rewetting in various parts of the world.

## Peatlands in the new climate agreement:

- Treat peatlands as lands with high mitigation potential, with adaptation and sustainable development co-benefits, in ADP WS2.
- More comprehensive accounting for the land sector could involve covering more activities, covering more land or covering more emissions. For cost-efficiency it is wise to focus on hotspots: concentrated emissions with large reduction potential. A hotspot approach combines efficient MRV with environmental integrity.
- Taking into account the disproportionately large current and potential emissions from peatlands, it is essential that accounting for peatlands becomes mandatory in the 2015 agreement.
- Mandatory accounting of peatlands can be achieved by a full activity- or land-based accounting of all managed lands, or – more efficiently – with a Wetland Drainage and Rewetting (WDR)-like approach that only accounts for a change in the drainage status of organic soils.
- It is paramount to prevent peatland drainage and to incentivise rewetting of peatland in non-Annex 1 countries through REDD+ and NAMA's.
- AFOLU should use similar reporting and accounting rules (net-net) as the other sectors to simplify inclusion of land use in the ADP, and build comparability and transparency.

## Background information:

### Current UNFCCC incentives to reduce emissions from peatlands through rewetting

**All Annex I countries** report emissions and removals from peatlands in the various land categories. Under the Kyoto Protocol peatlands are reported (and accounted when mandatory or elected) under AR/D, forest management (FM), cropland management (CM), grazing land management (GM) and revegetation (RV). The new voluntary accounting activity 'Drainage and Rewetting' (WDR) allows Parties for the Second Commitment Period to account for emissions and removals from peatland under agricultural use, if changes in drainage conditions have taken place, even when they have not chosen GM and CM as accounting activities.

**All developing countries** need to report emissions and removals from peatlands/organic soils. Tropical countries need to take into account that *all* forested peatlands (peat swamp forests, many mangroves) -even with a shallow peat layer - have more carbon in their soil than in their entire biomass. As a result peatlands/organic soil always constitute a significant pool in these areas and countries. When participating in REDD+, this pool must be taken into account.

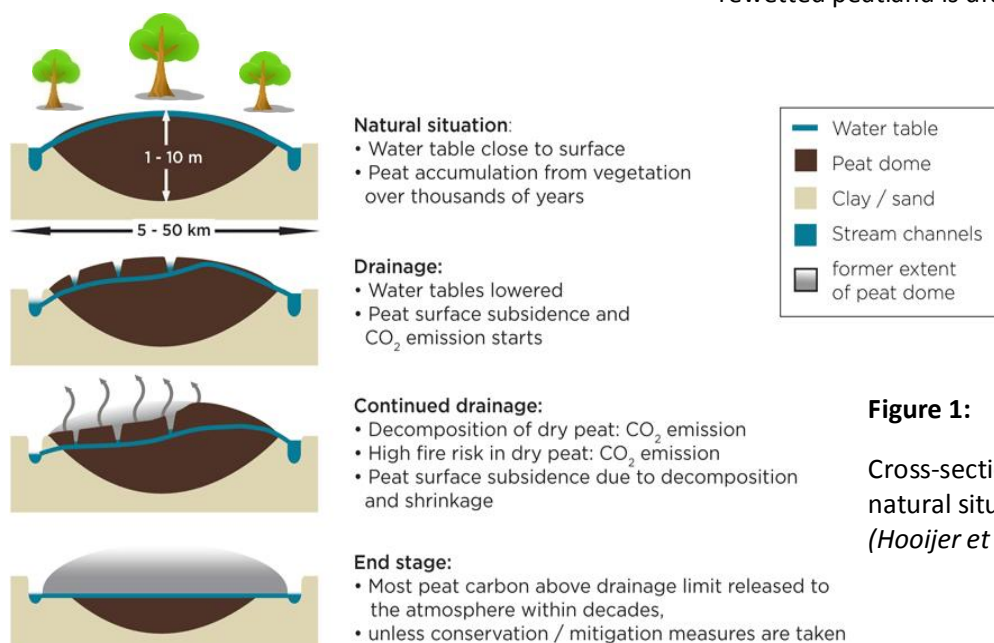
Drained non-forested peatlands in non-Annex I countries are often used as grazing land and cropland. Anthropogenic emissions from these lands are huge. NAMA's provide opportunity to reduce these emissions and tap into the enormous mitigation potential.

### Lack of data

Lack of data has been used as an argument to insist that much of the accounting in LULUCF remains voluntary. However, many data on organic soils are already available. Before new LULUCF rules come into operation, peat-rich countries should make sufficient efforts to enable accounting for all emissions/removals from peatlands. Developing countries should receive support for capacity building for reporting and accounting for organic soils.

### Rewetting: permanent emission reductions

Peatland rewetting reduces emissions. Similar to other emission reduction activities, e.g. in the Energy sector, they do not have problems with non-permanence. All reductions are permanent. Any reductions achieved, have a lasting effect even if the activities come to an end, e.g. if rewetted peatland is drained again.



**Figure 1:**

Cross-section of a peat dome in natural situation and after drainage (Hooijer et al 2006/2010).

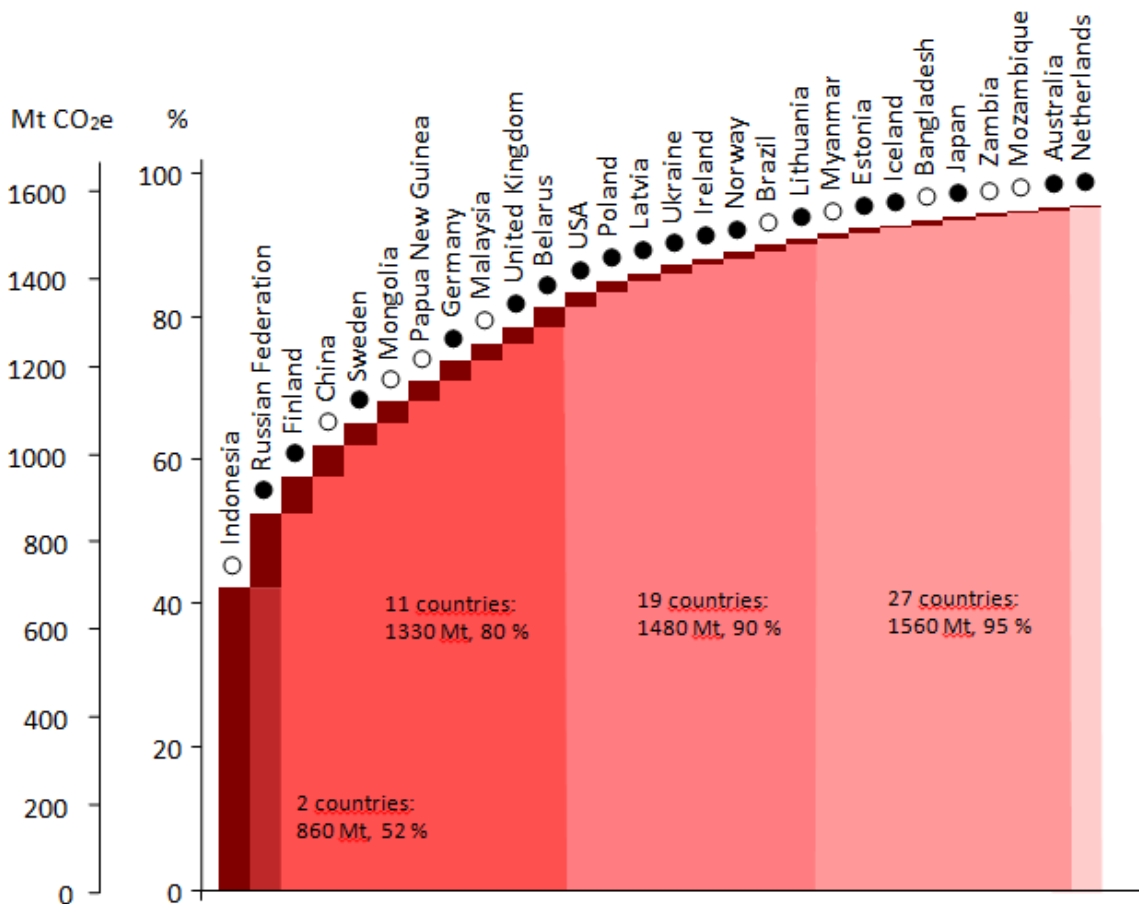
## Hotspots of emissions from peatlands (~organic soils)

There are many countries with peat soils. But only 2 countries are currently responsible for 50% of the total GHG emissions from peatlands, 11 countries cover 80% of the total emissions, 19 countries 90%, and 27 countries 95%.

The figure below shows the amount of greenhouse gas emissions in a cumulative way in Mt CO<sub>2</sub>e per year (Mt = mega-tonne = 1 000 000 tonnes) and as percentage of the total global emissions from

degrading organic soils. Emissions are shown for the 28 countries responsible for most of the emissions in descending order.

White dots denote non-Annex 1 countries, black dots Annex 1 countries. Red shades indicate where the 50, 80, 90 and 95 percent marks are crossed.



### Sources figure 2:

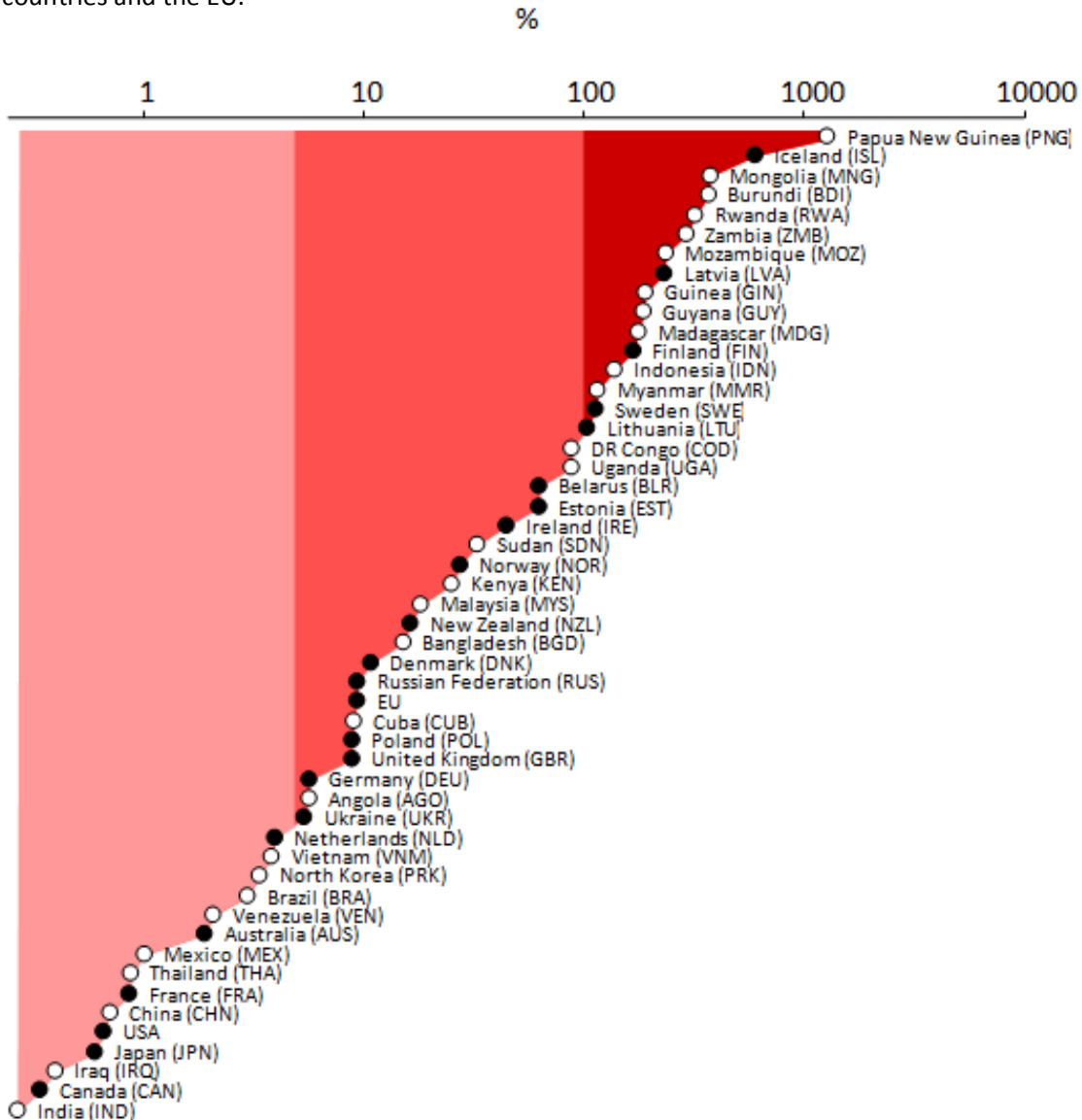
- Peatland emissions are calculated using default emission factors from the IPCC 2013 Wetlands Supplement and include water borne carbon losses, N<sub>2</sub>O emissions from fields and CH<sub>4</sub> emissions from fields and ditches. Global warming potential for CH<sub>4</sub> and N<sub>2</sub>O are based on IPCC AR5.
- The area of drained peatland is taken from the most recent National Inventory Submissions and National Communications. Gaps were filled using the IMCG Global Peatland Database (*International Mire Conservation Group, www.imcg.net*).

## Emissions from peatlands compared to emissions from energy and cement

The figure below shows that in 15 countries emissions from degrading organic soils are higher than emissions from energy & cement (emissions are expressed as %), and in other countries they are comparable or at least significant.

White dots denote non-Annex 1 countries, black dots Annex 1 countries. Red shades mark where emissions from degrading organic soils are equivalent to less than 5, more than 5 and more than 100 percent of emissions from energy & cement.

Values are shown on a logarithmic scale for 50 countries and the EU.



### Sources Figure 3:

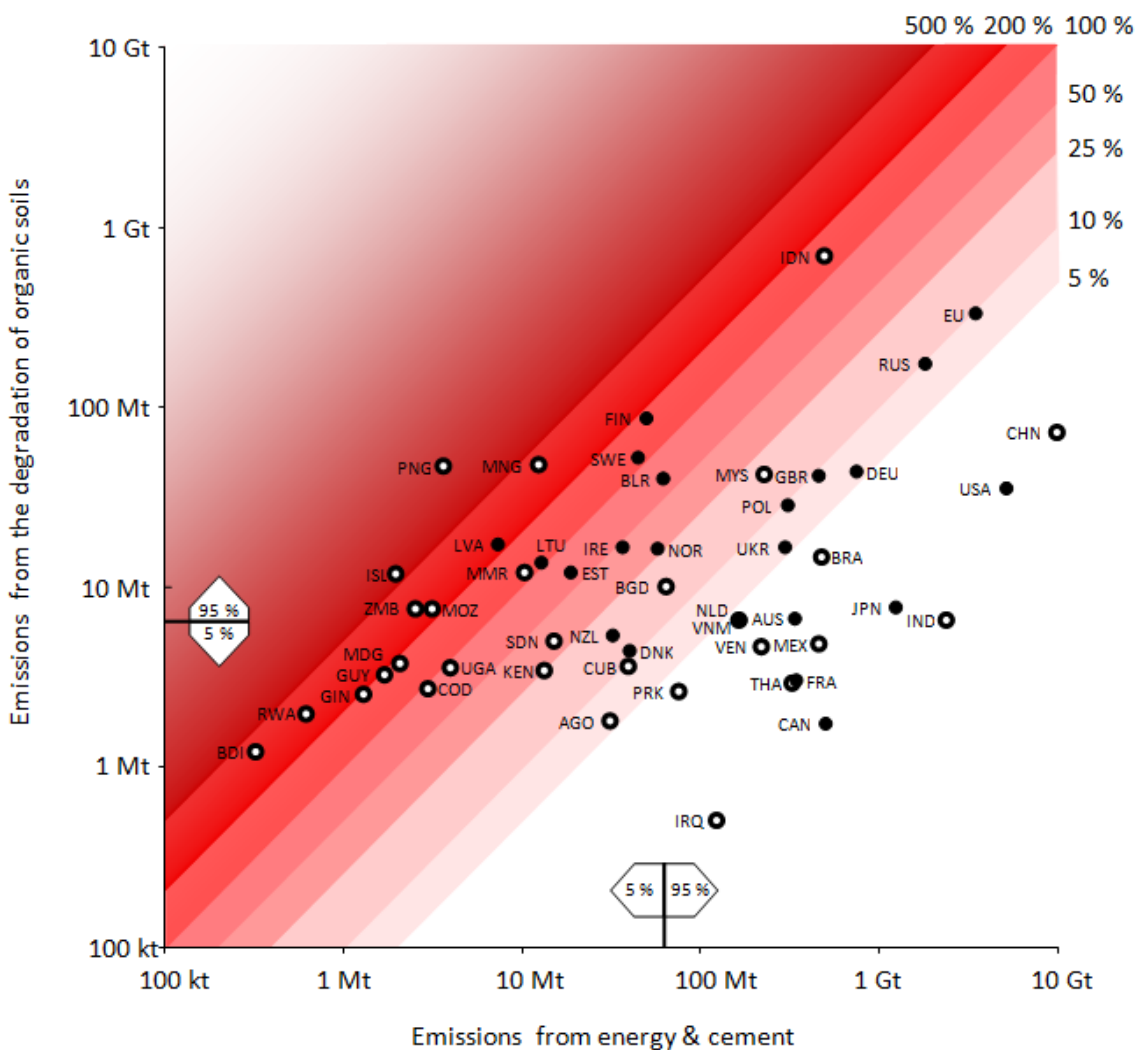
- Data sources as for Figure 2.
- Data on emissions from energy and cement are taken from the Global Carbon Project ([www.globalcarbonproject.org](http://www.globalcarbonproject.org)).

The figure below also shows the emissions from degrading organic soils (vertical axis) in relation to emissions from energy & cement (horizontal axis) for 50 countries and the EU, but in addition shows which countries are responsible for 95% of the total emissions from energy & cement and which for 95% of the emissions from peatlands.

Emissions are shown on a logarithmic scale (kt = kilo-tonne = 1000 tonnes, Mt = mega-tonne = 1 000 000 tonnes, Gt = giga-tonne = 1 000 000 000 tonnes). Countries are denoted by a 3 letter code (see Figure 3).

White dots denote non-Annex 1 countries, black dots Annex 1 countries. Red shades indicate where emissions from organic soils are equivalent to more than 5, 10, 25, 50, 100, 200 and 500 percent of emissions from energy & cement.

Flags on the horizontal axis separate the countries responsible for 95% of total emissions from energy & cement from the remaining 5% of countries (not all countries plotted); flags on the vertical axis do the same for emissions from the degradation of organic soils.



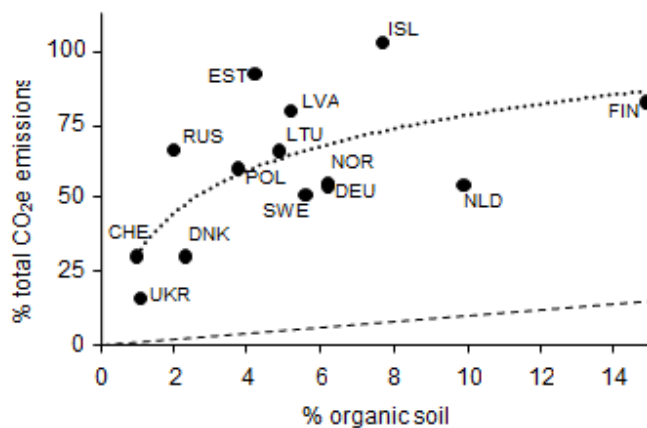
**Sources Figure 4:**

- Data sources as for Figures 2 and 3.

## Organic soils, concentrated areas with high emissions

**Peatlands are hotspots of emissions: emissions are significant, but result from an only limited area of land. CO<sub>2</sub> emissions from peatlands constitute one of the major sources of greenhouse gas emissions from agriculture, next to animal husbandry, rice cultivation and fertilizer application.**

The figure to the right illustrates the contribution of organic soils to the net greenhouse gas emissions from agricultural soils vs. the area of organic soils under agriculture.



Emissions are expressed as percentage of total CO<sub>2</sub>e emissions from agricultural soils; the area of organic soils as percentage of total area under agriculture (cropland and grassland). The dashed line depicts the 1:1 ratio, the dotted line a crude logarithmic fit (GWP of N<sub>2</sub>O = 298).

**Source Figure 5:** National Inventory Submissions 2013. Where needed emission factors were brought in line with the IPCC 2013 Wetlands Supplement.

**Call for action: treat peatland as *emission hotspots* in a new climate agreement.**

*Wetlands International worked with Alexandra Barthelmes, John Couwenberg and Hans Joosten from Greifswald University to prepare this paper.*

*Our work on addressing greenhouse gas emissions from peatlands is financially supported by the Netherlands Ministry of Foreign Affairs, DGIS and by Norad.*

### More information:

Wetlands International

Susanna Tol

Phone: +31 622624702

Email: [susanna.tol@wetlands.org](mailto:susanna.tol@wetlands.org)

