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Peatlands and Climate Change

Jan Peters, Michael Succow Foundation

Prof. Hans Joosten, Greifswald University

Last 20 years were warmest years on record, with increasing risks for food and water security…

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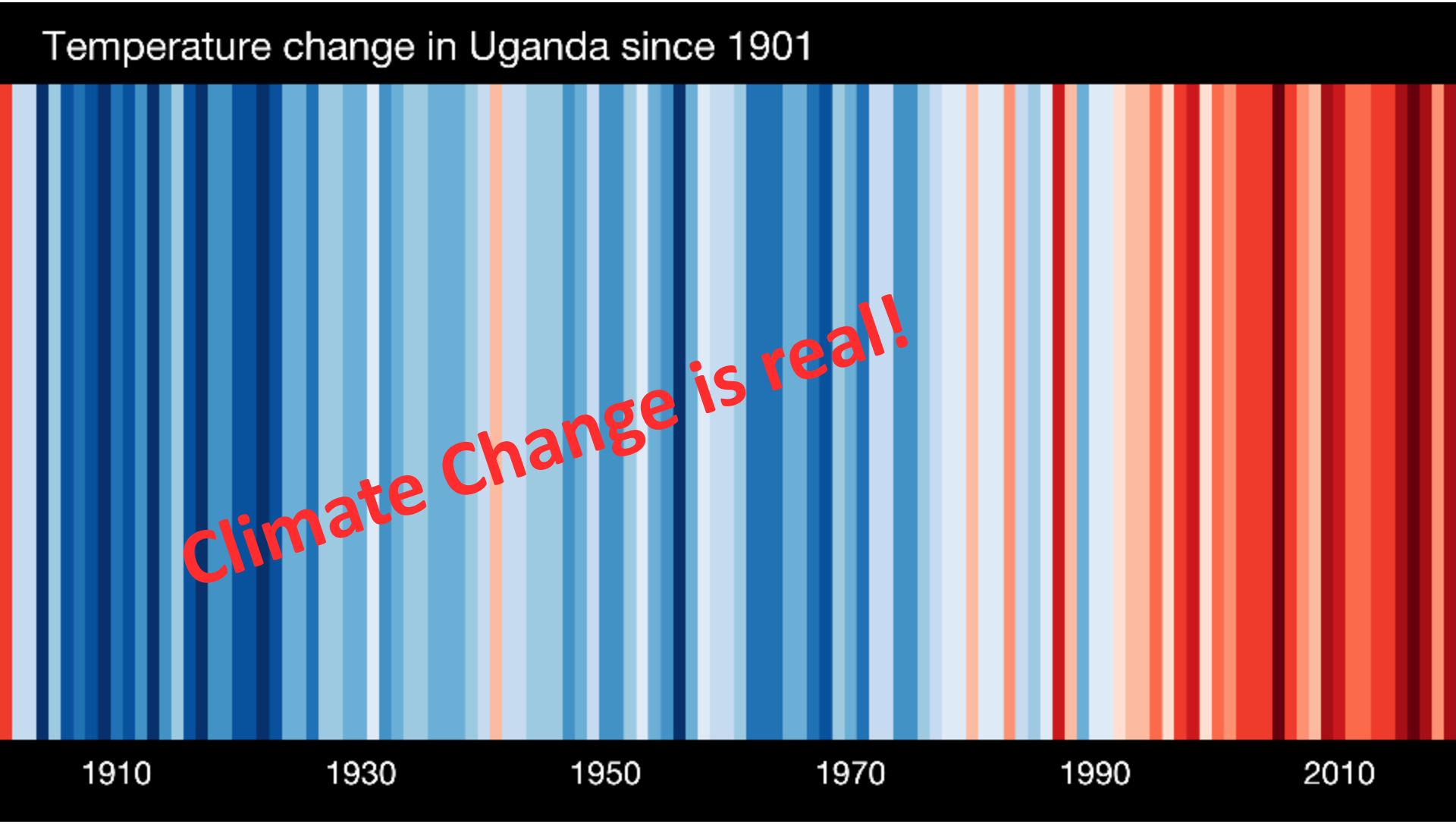
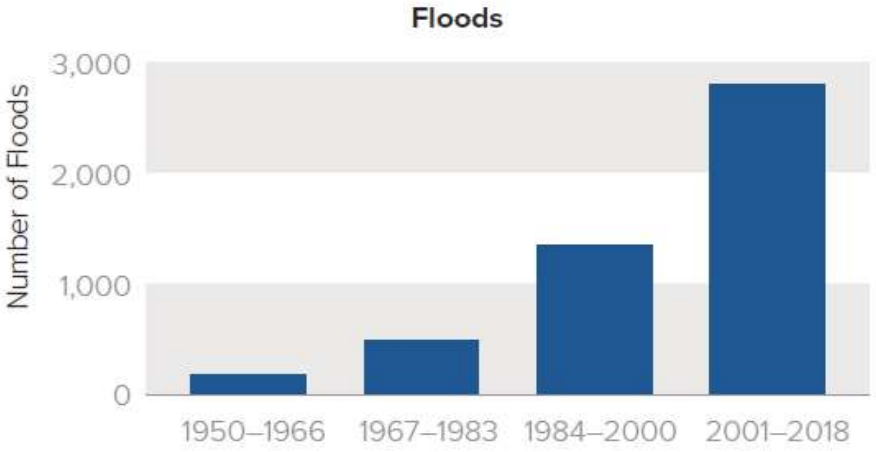


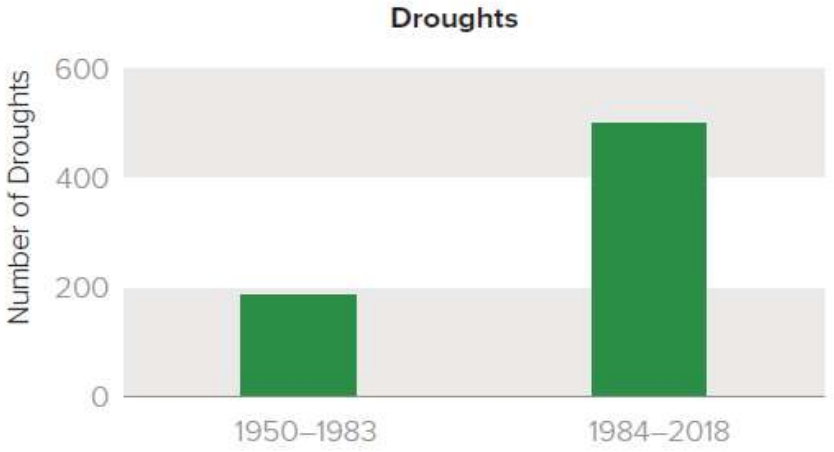
Disasters triggered by climate caused in 2017 thousands of deaths and US$320 billion in losses…

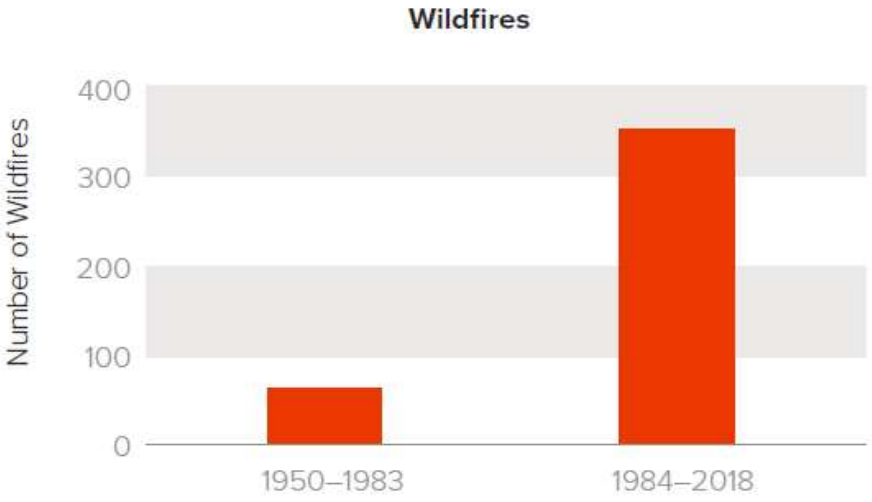
Borneo

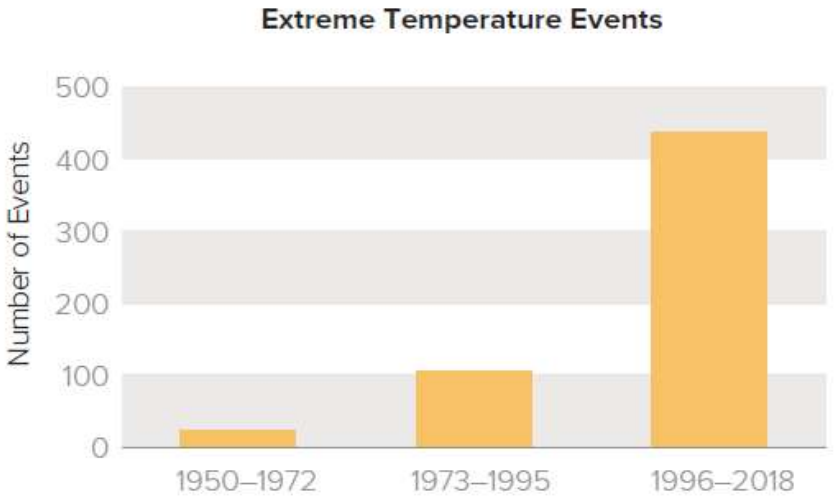
Frequency and severity of disasters have since 1950 increased

Floods, Droughts, Fires, x-trem Temperatures









This– we *all* agreed – have to stop….

Paris has made the world simple: one common goal: $< 2^{o}$

Georgia

< 2° → 0 emissions by 2050: me, you, we: no more excuses

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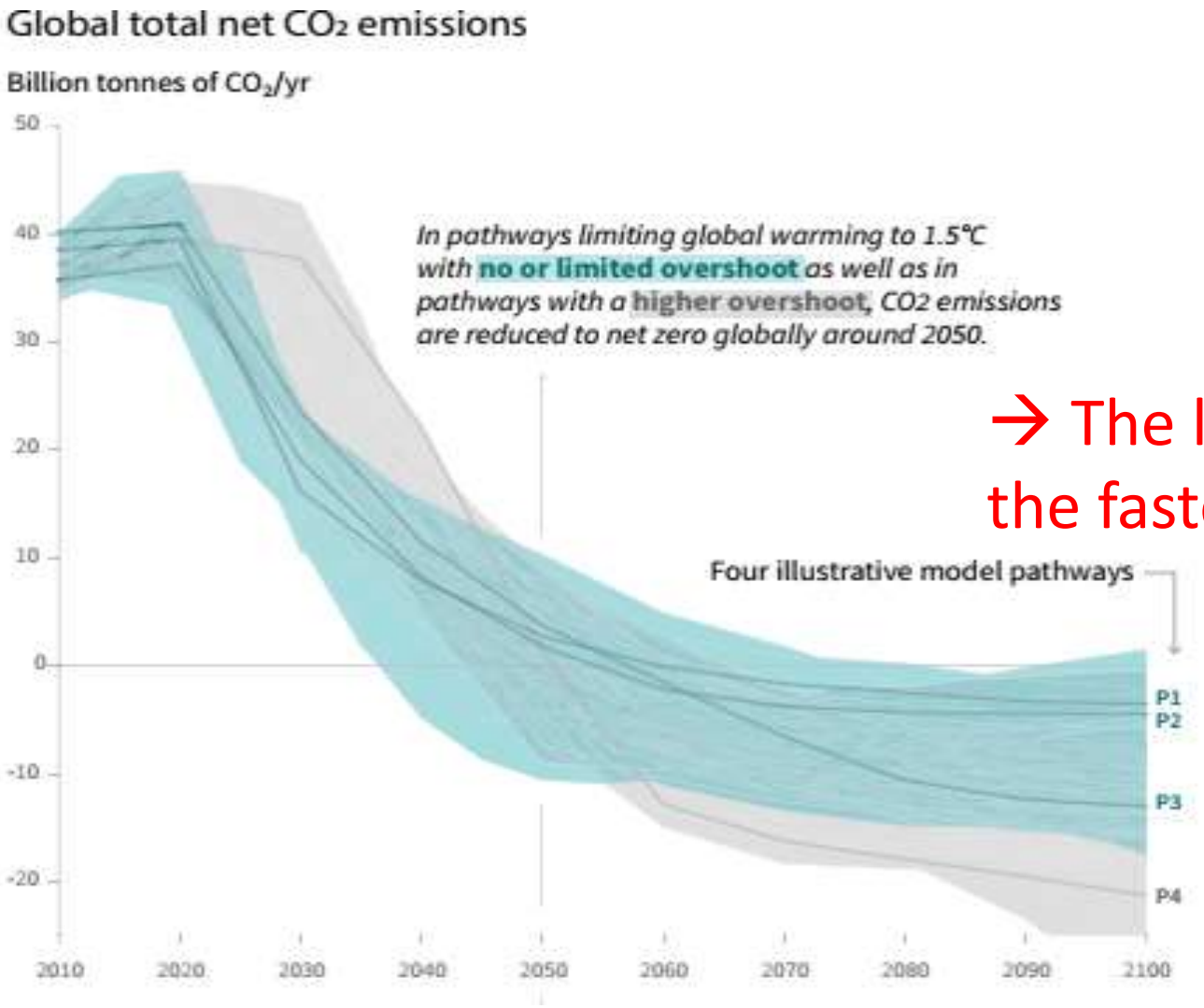

→ The longer we wait, the faster we must reduce

IPCC 2018 SR15

Paris agreement: “…in the context of sustainable development and efforts to eradicate poverty”…

North Korea

→ breaking radically with routines from the past, also with respect to peatlands

Belarus

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Terms

A wetland is an area with a prevalence of vegetation typically adapted for life in saturated soil conditions

A peatland is an area of land with a naturally accumulated peat layer on its surface.

Peat is sedentarily accumulated material consisting of at least 30% (dry mass) of dead organic material.

A mire is a peatland on which peat is currently forming and accumulating.

In living peatlands (‘mires’):

- Biomass production larger than decay
- Dead plants accumulate as ‘peat’

Georgia

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

Peat accumulates through water saturation…

Belarus

Global peatland distribution clearly reflects a zonal pattern…

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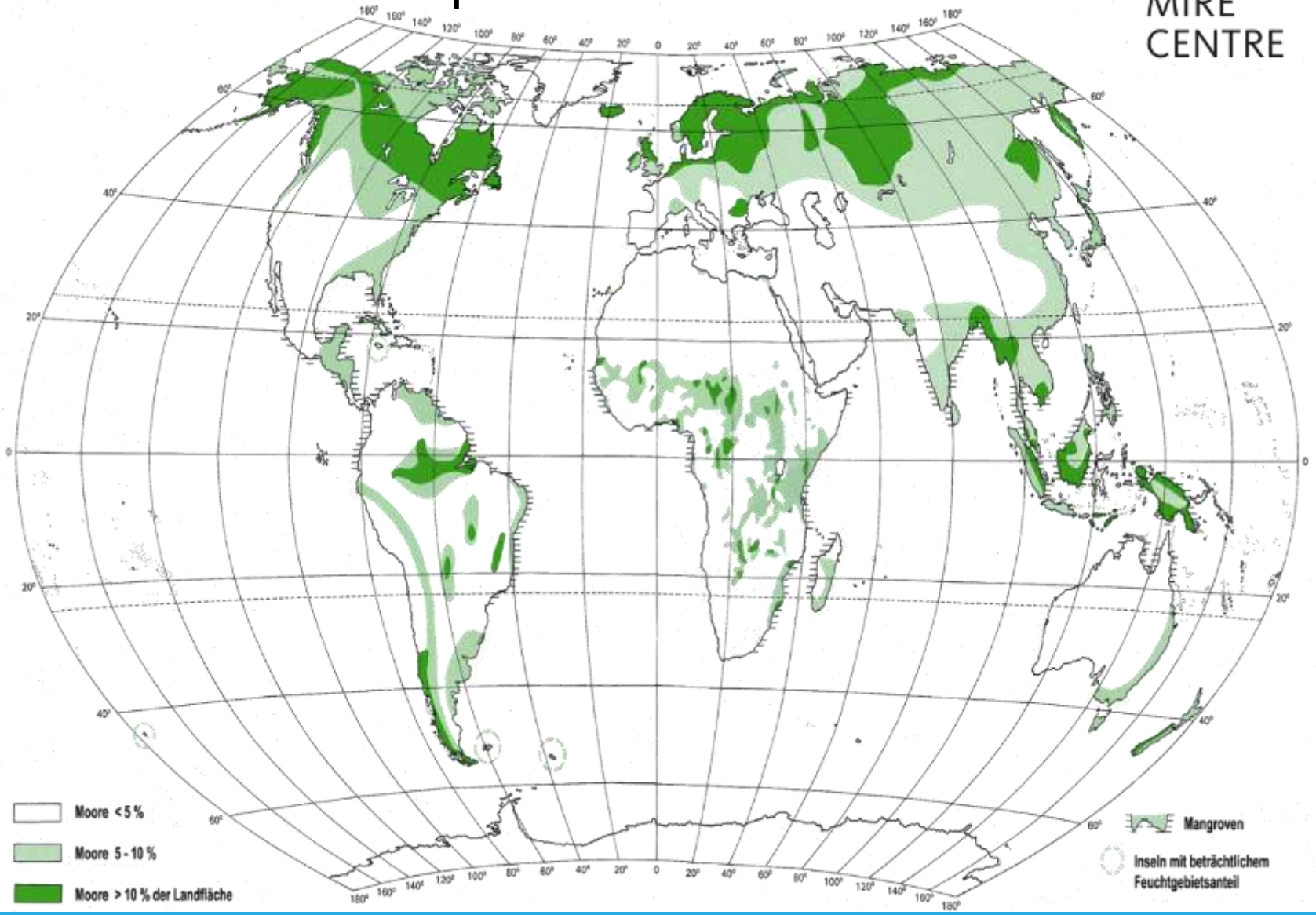

…related to distribution of precipitation

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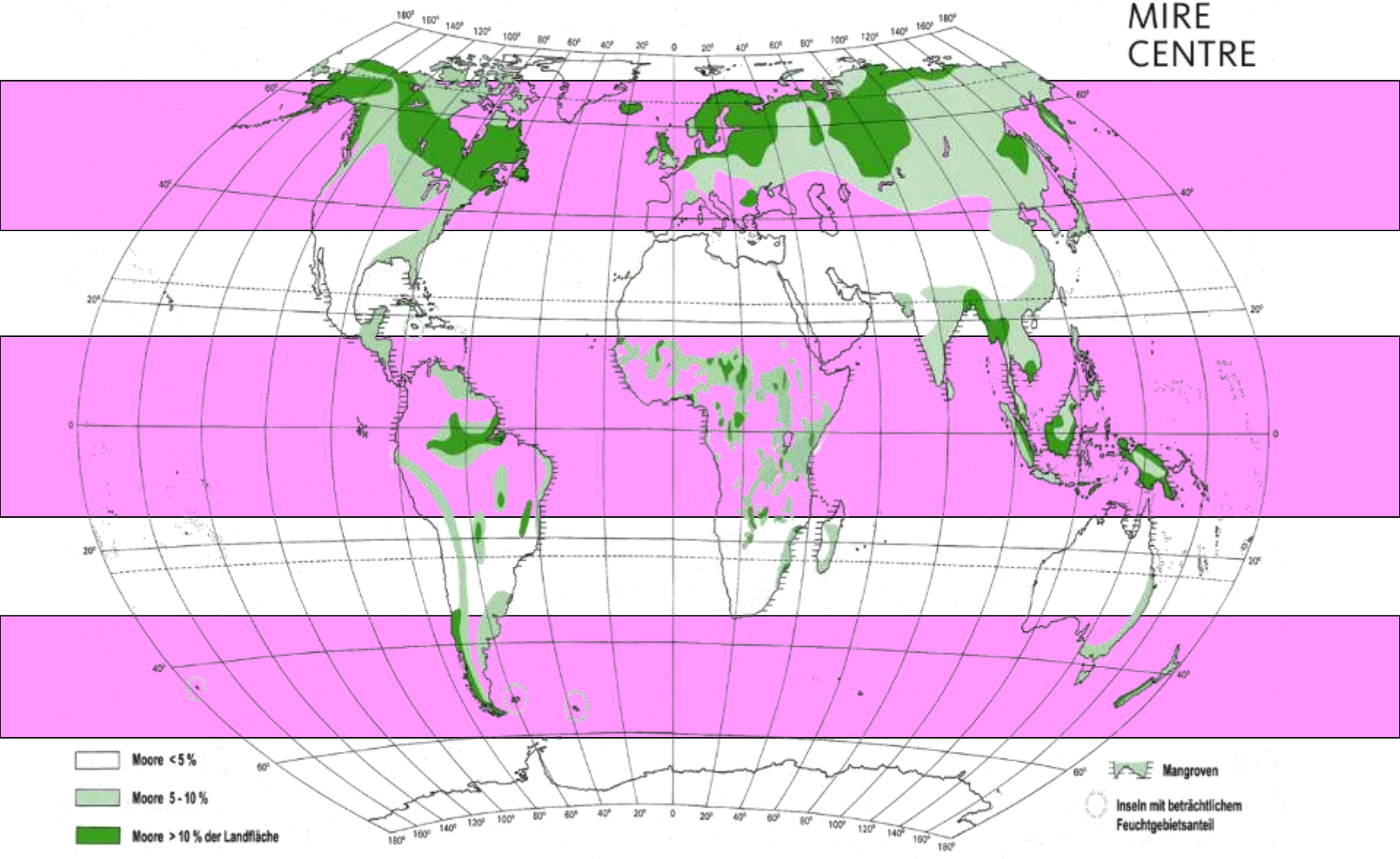
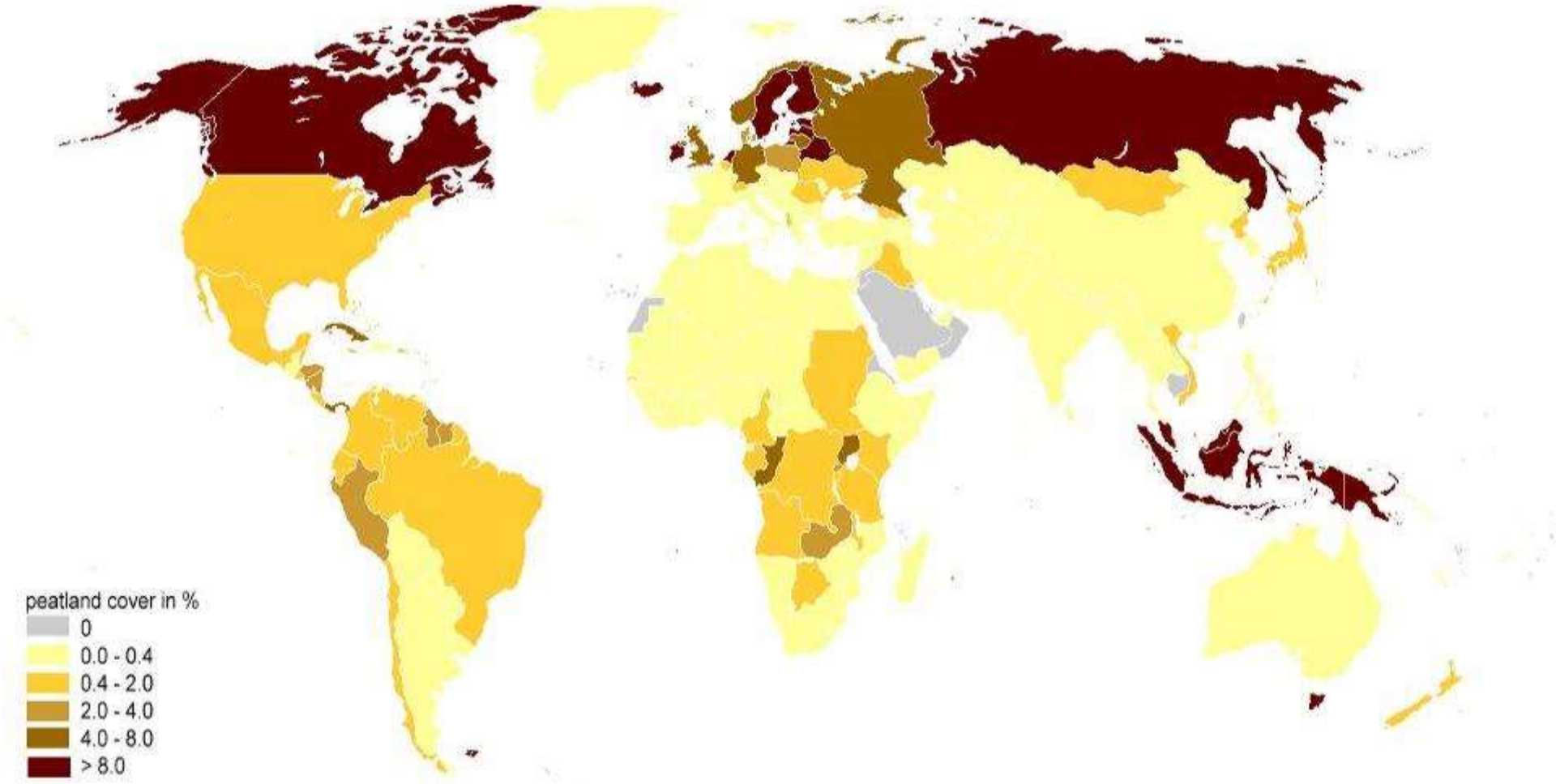


Peatlands are found in almost every country and very diverse.
Worldwide: 4 million km^2



Joosten 2009

…the Cinderella Syndrom…

Ruoergai, China

…the Cinderella Syndrom…

Ramsar Convention ‘overlooked’ peatlands during 25 years

…although the city of Ramsar is surrounded by peatlands…

Ramsar, Iran

UNFCCC 2006 (Nairobi): In Kenya there is no peat…

Kenya 10 km from the Nairobi Convention venue

UNFCCC 2011 (Panama): We didn‘t know we had peat swamps

Damani, Panama

Living peatlands are climate neutral: CO_2 sink balanced +/- by CH_4 source

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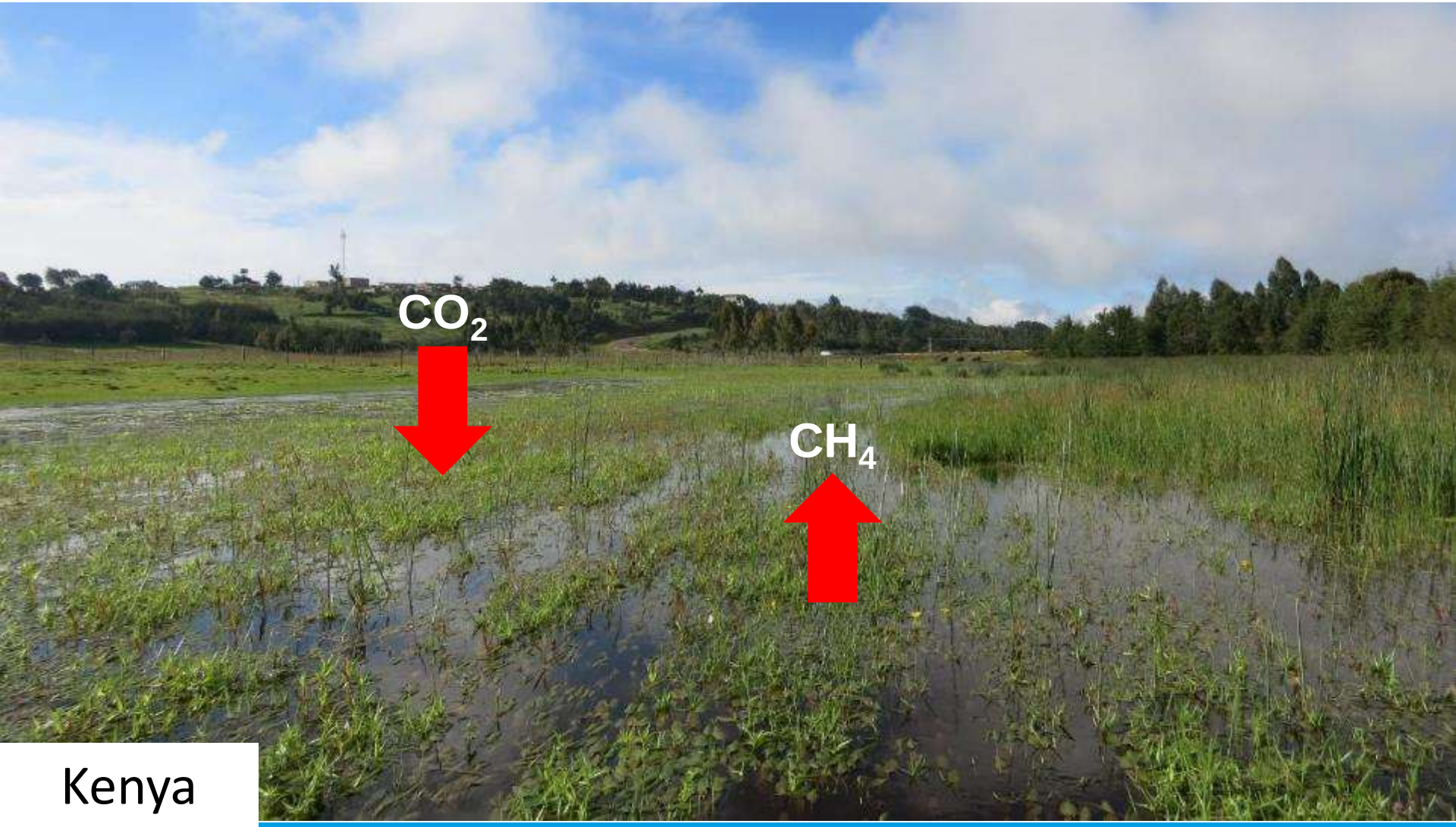

Kenya

While covering only 3% of the World's land area, peatlands contain >500 Gigaton of carbon

Rwanda

i.e. twice the carbon stock of the world's total forest biomass

Malaysia

A 15 cm thick peat layer contains per hectare more carbon than a High-Carbon-Stock tropical rainforest

Gabon

Peatland problems are caused by **drainage**

Rwanda/Burundi

Peat is like gherkins: when you remove the conserving water, the organic matter rots away

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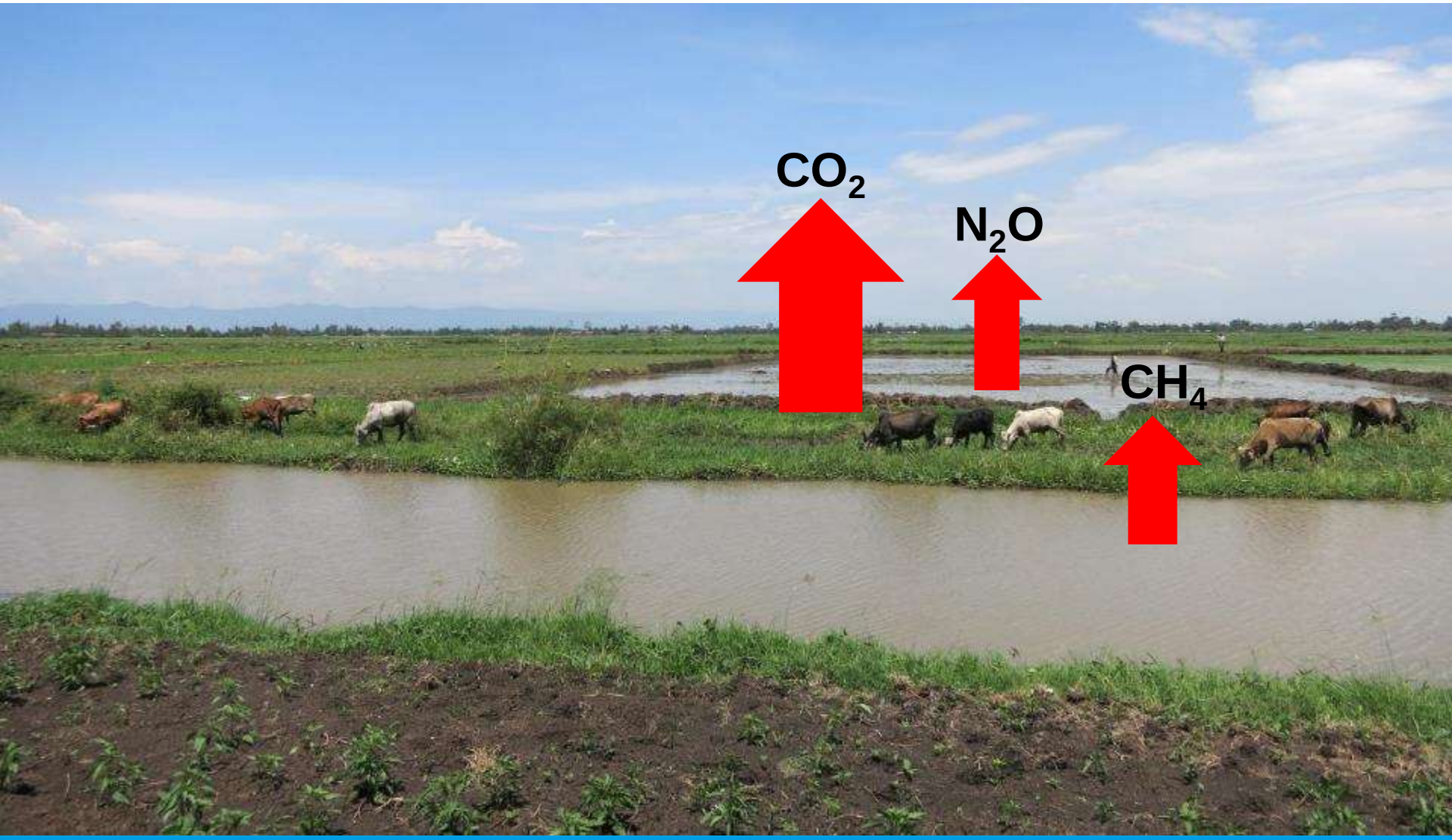
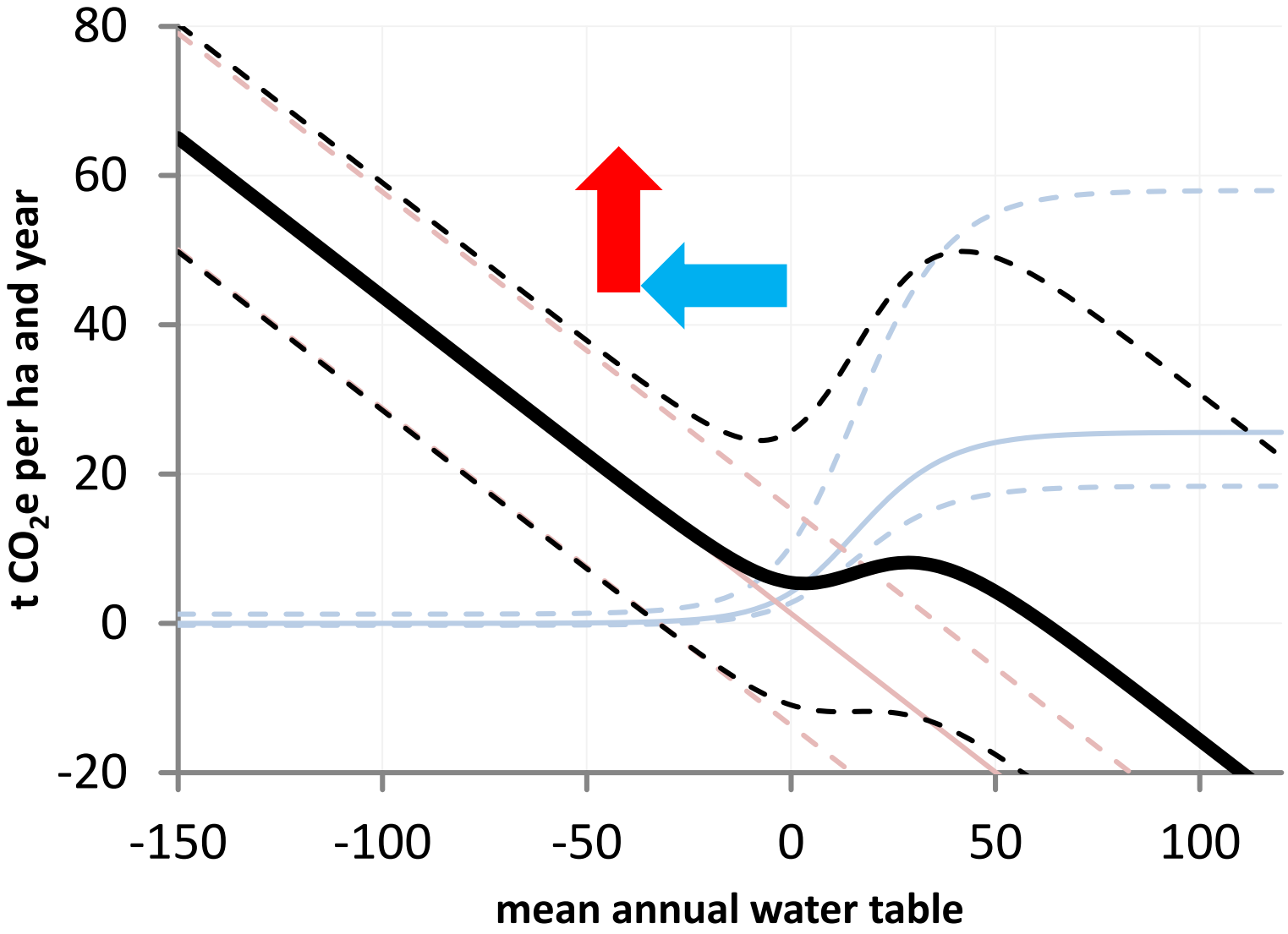
By drainage peat is oxidized

→ GHG released + soil subsidence



Deeper water table → more greenhouse gas emissions

→ -10 cm drainage = 5 t CO_2eq.



Deeply drained grassland on peat emits 30 T CO_2e /ha/yr = 145,000 km with middle class car

1 kg Cheese = 55 kg CO_2

1 L Milk = 2,4 l petrol

Oil palm on peat in the tropics emits 60 t CO_2e /ha/yr
= 300.000 km by car: every hectare, every year

Malaysia

Globally, drained peatlands emit 2 Gt CO_2e /yr,
i.e. 0.4 % of the land produces 5% of all global emissions

Peatland emissions per country (Mt CO_2e/yr): highest global urgency for peatland action

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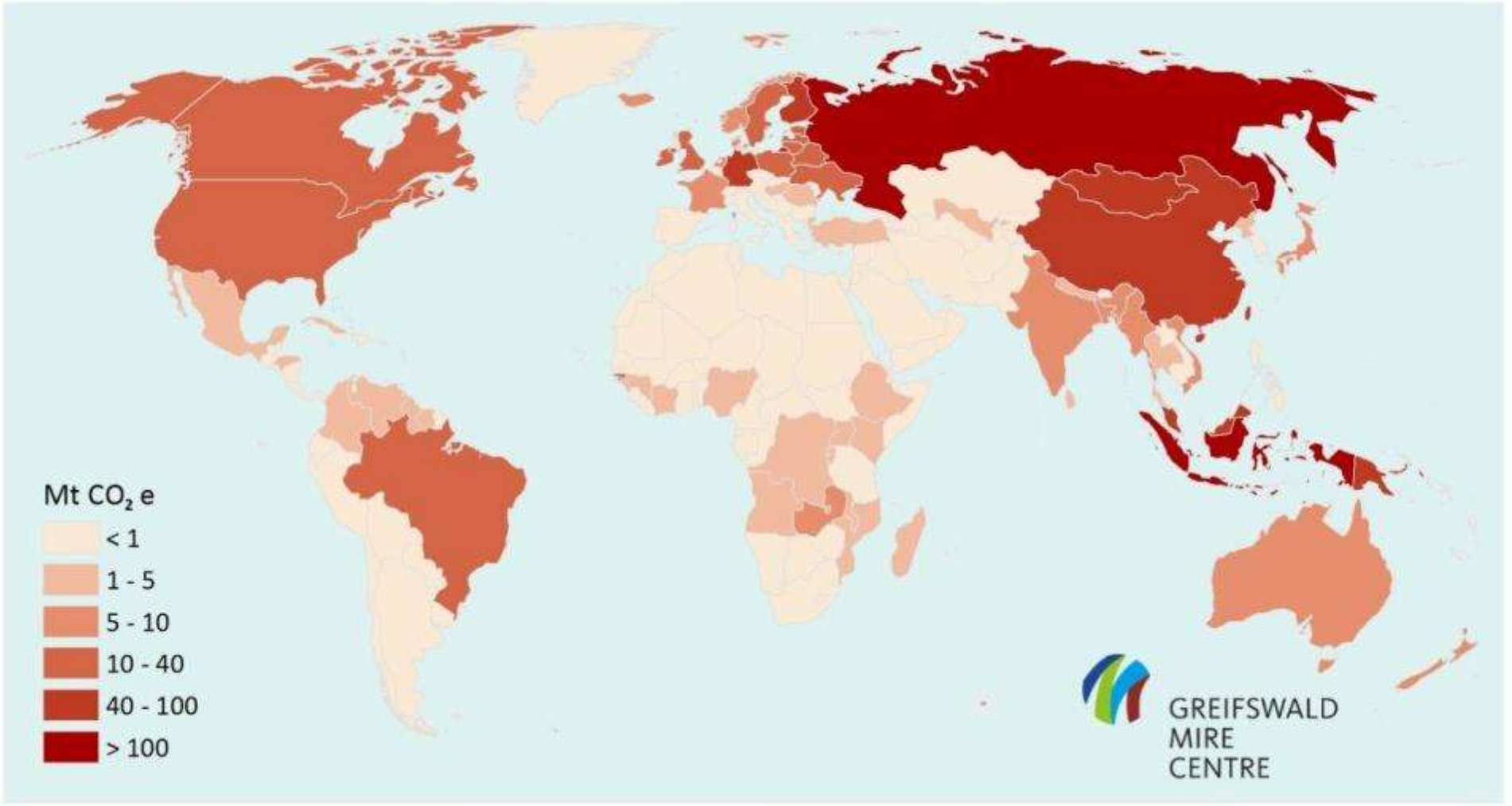

But only few parties mention peat-/wetlands in their UNFCCC NDCs

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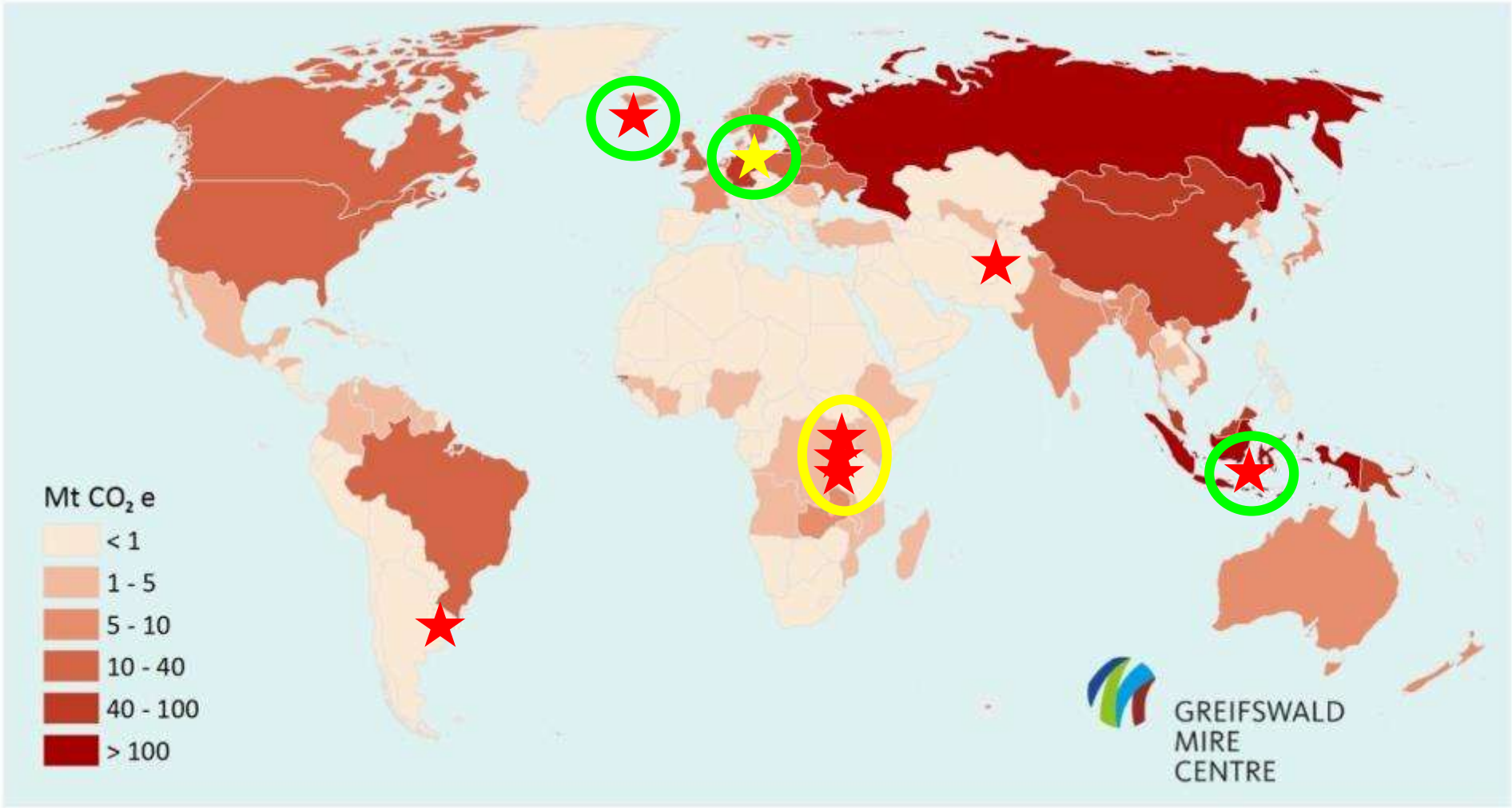

Peatland differs from forest

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- Forest emissions (wood C) are related to land use *change*, peatland emissions (peat C) to the (resulting) land *use*
- Peatland emissions are cumulative!

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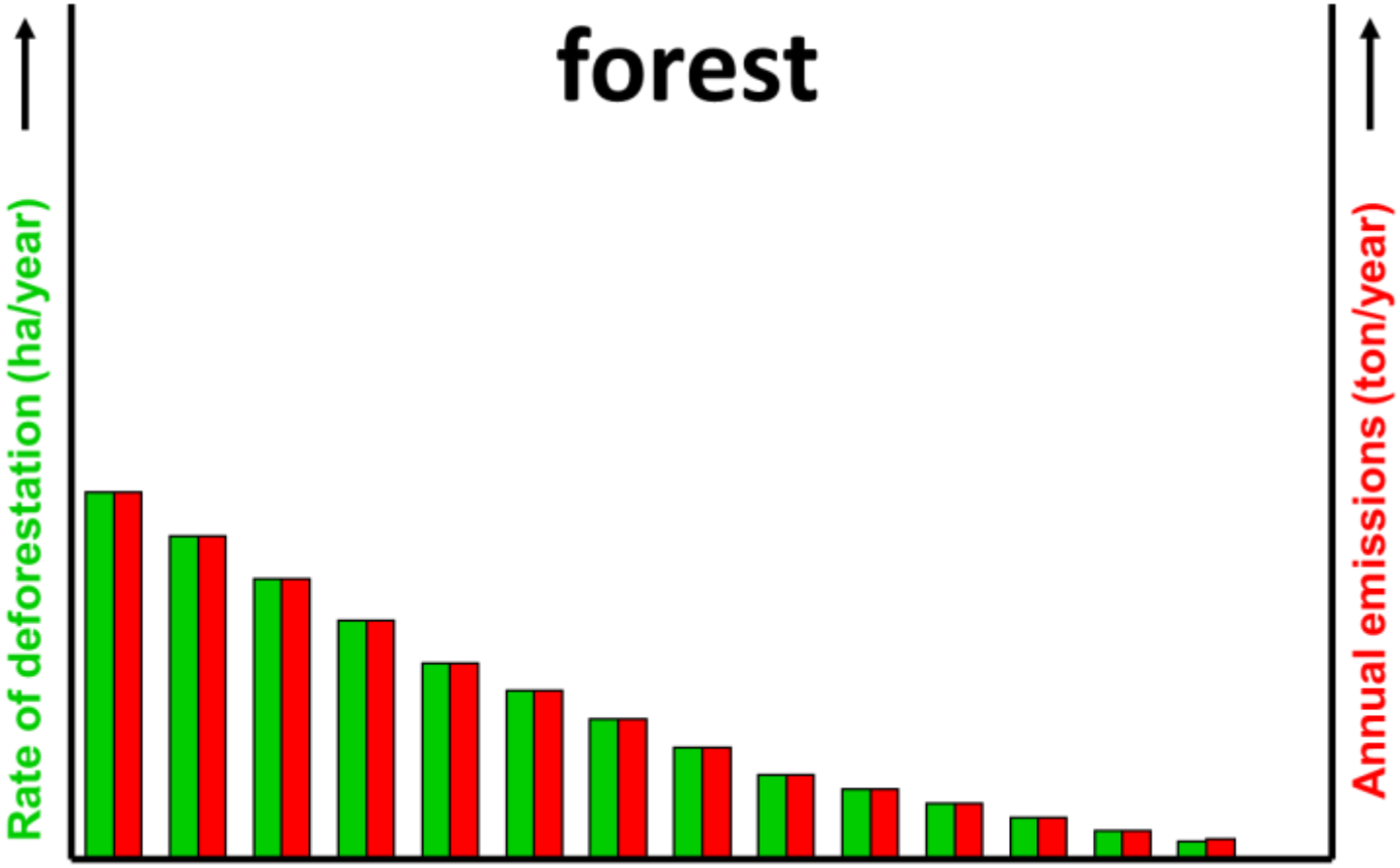
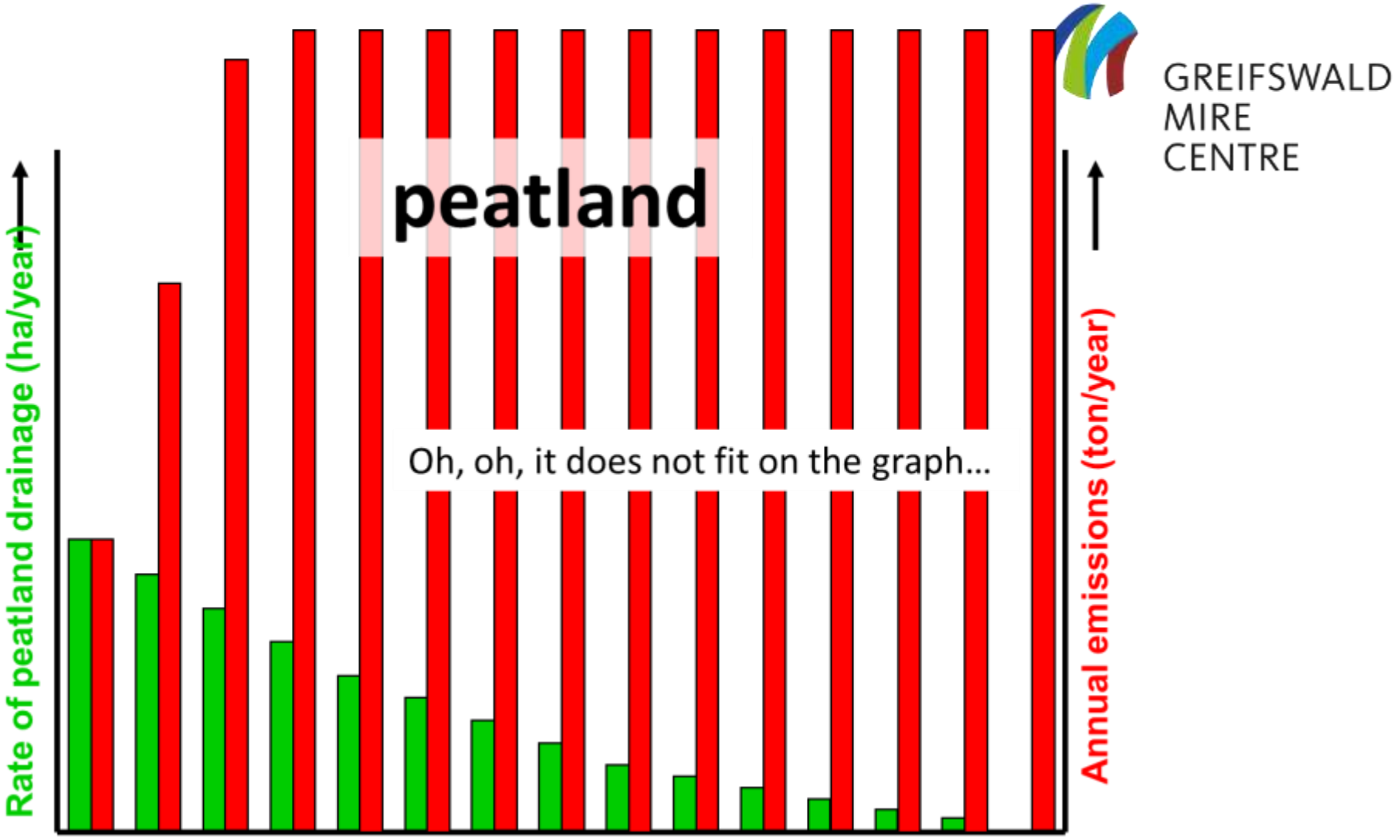


Decreasing the rate of deforestation decreases annual GHG emissions.



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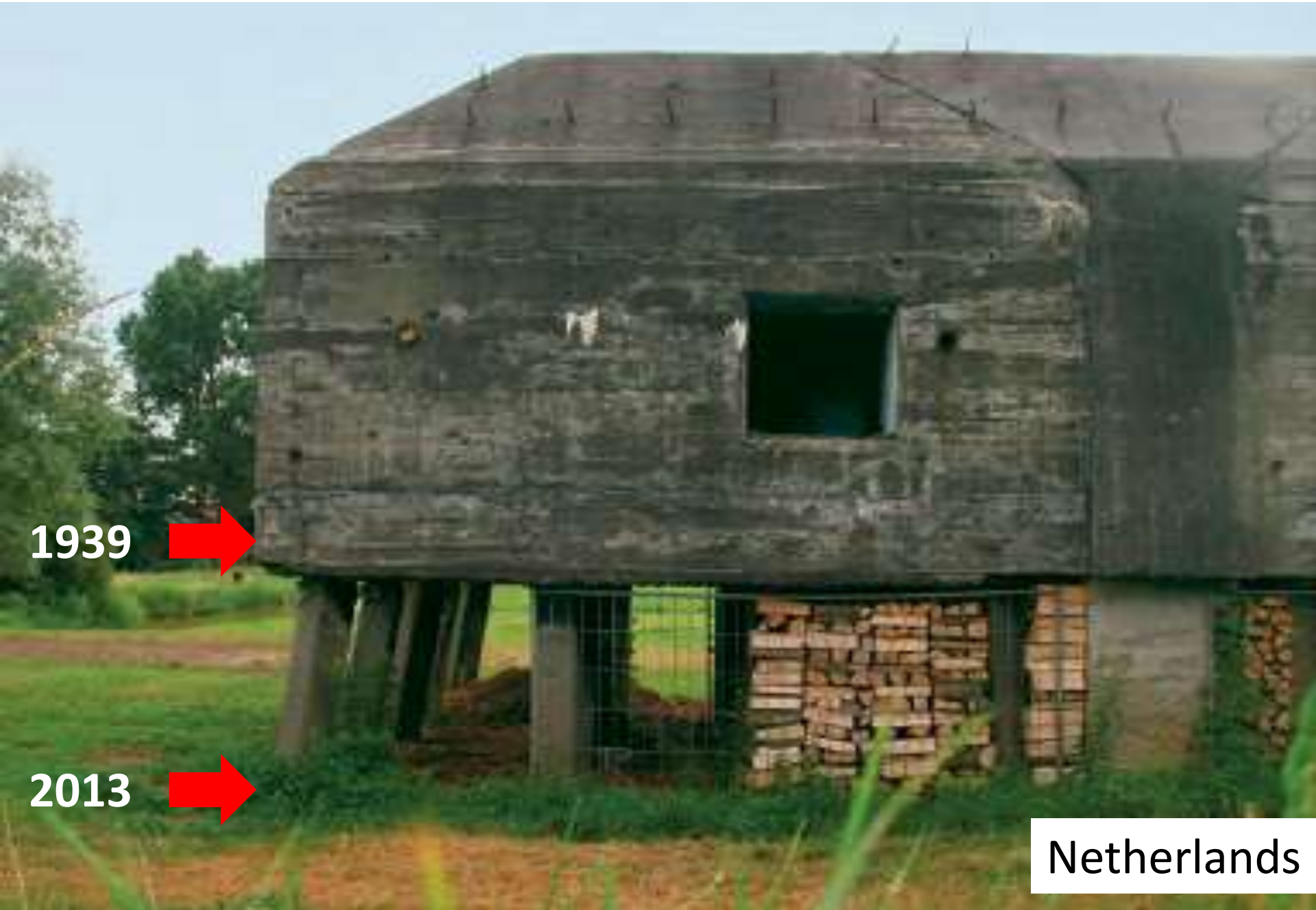
Decreasing the rate of peatland drainage ***increases*** annual GHG emissions because they ***add*** to already drained peat

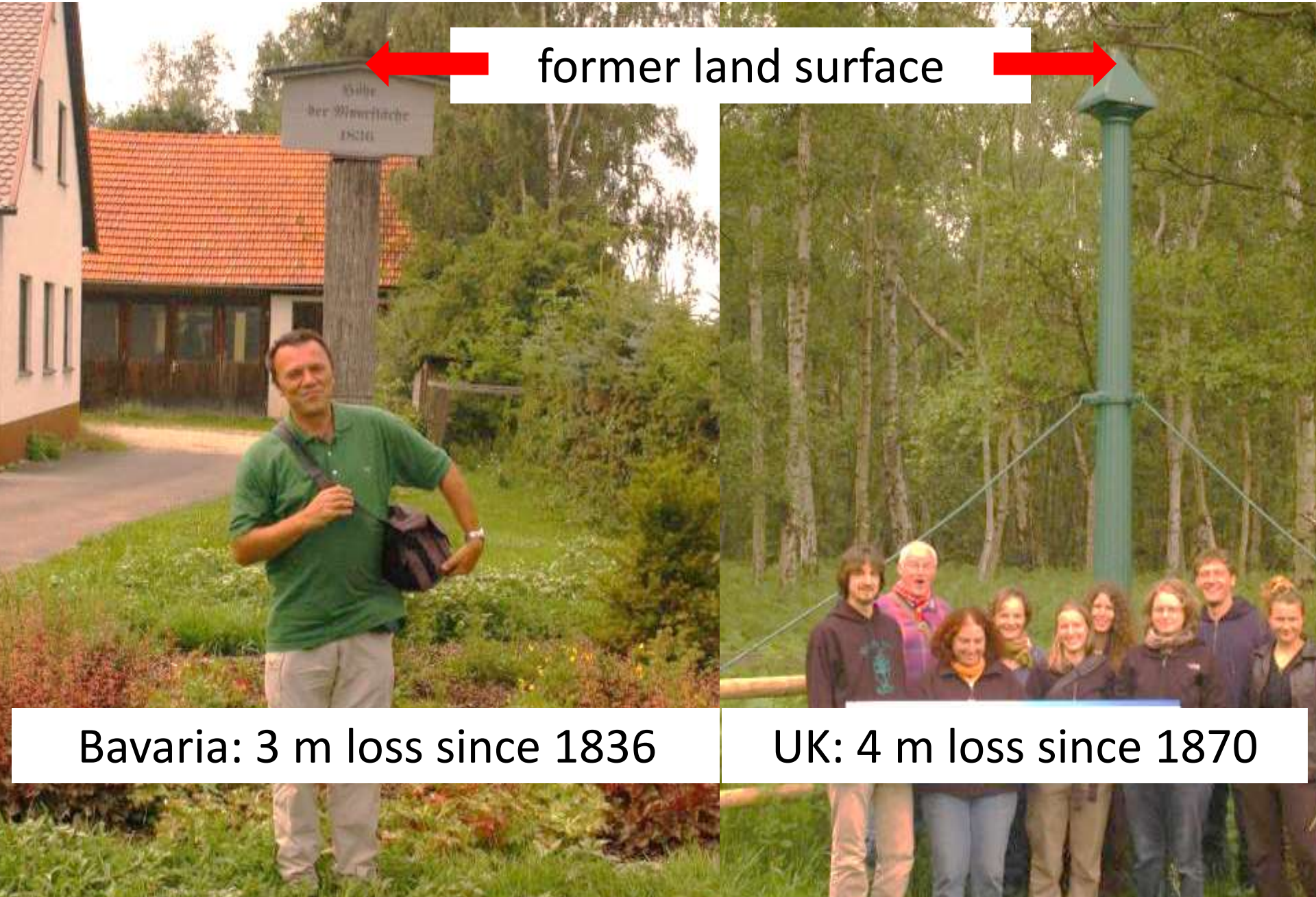
Drainage for agriculture is most important cause of emissions

Uganda

Too little recognized: Subsidence



Drainage→ subsidence (loss of height): 1-2 cm annually



…*Nether*-lands: bogged down by 1000 yr of peatland drainage and subsidence

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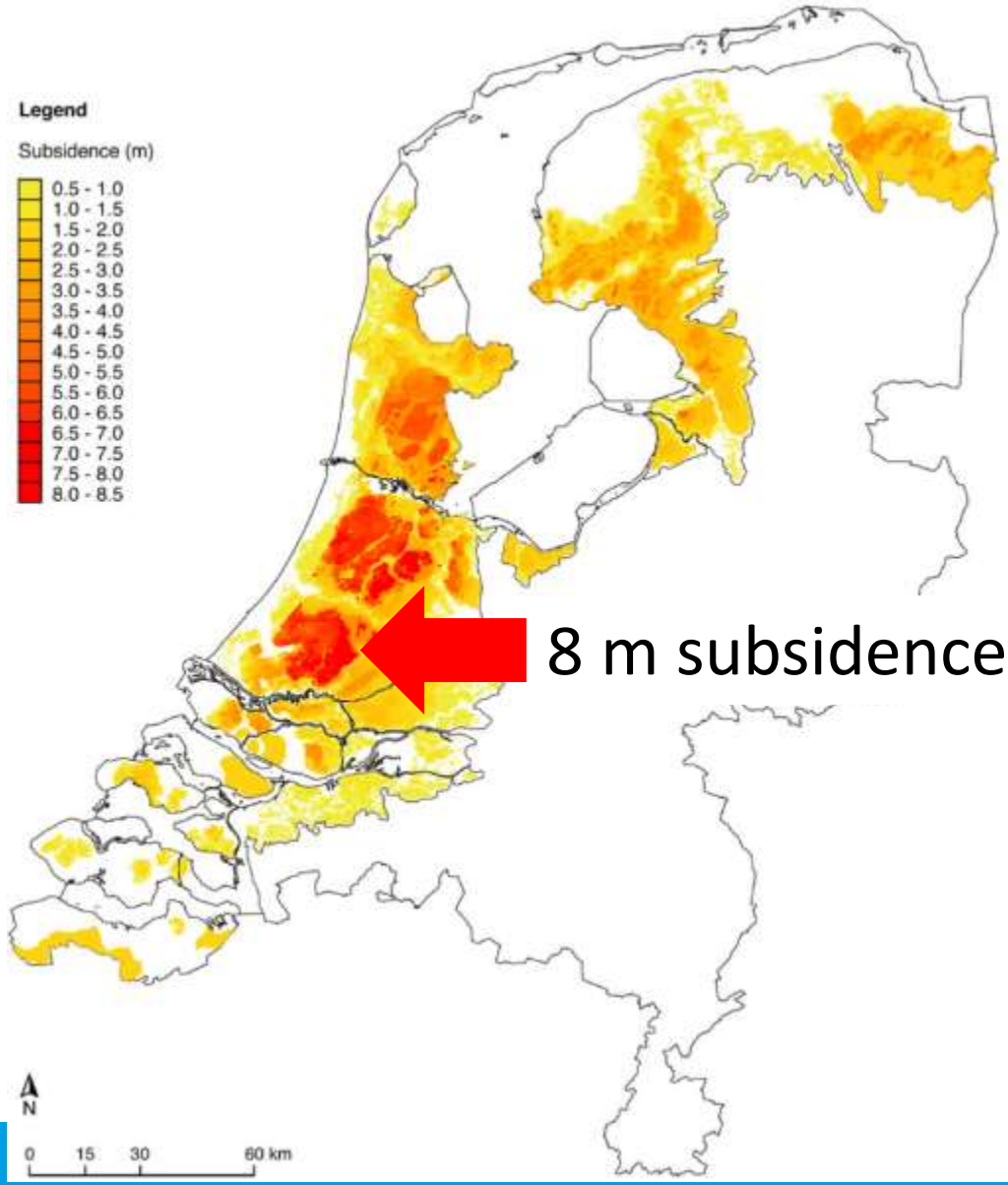

…and subsidence continues…

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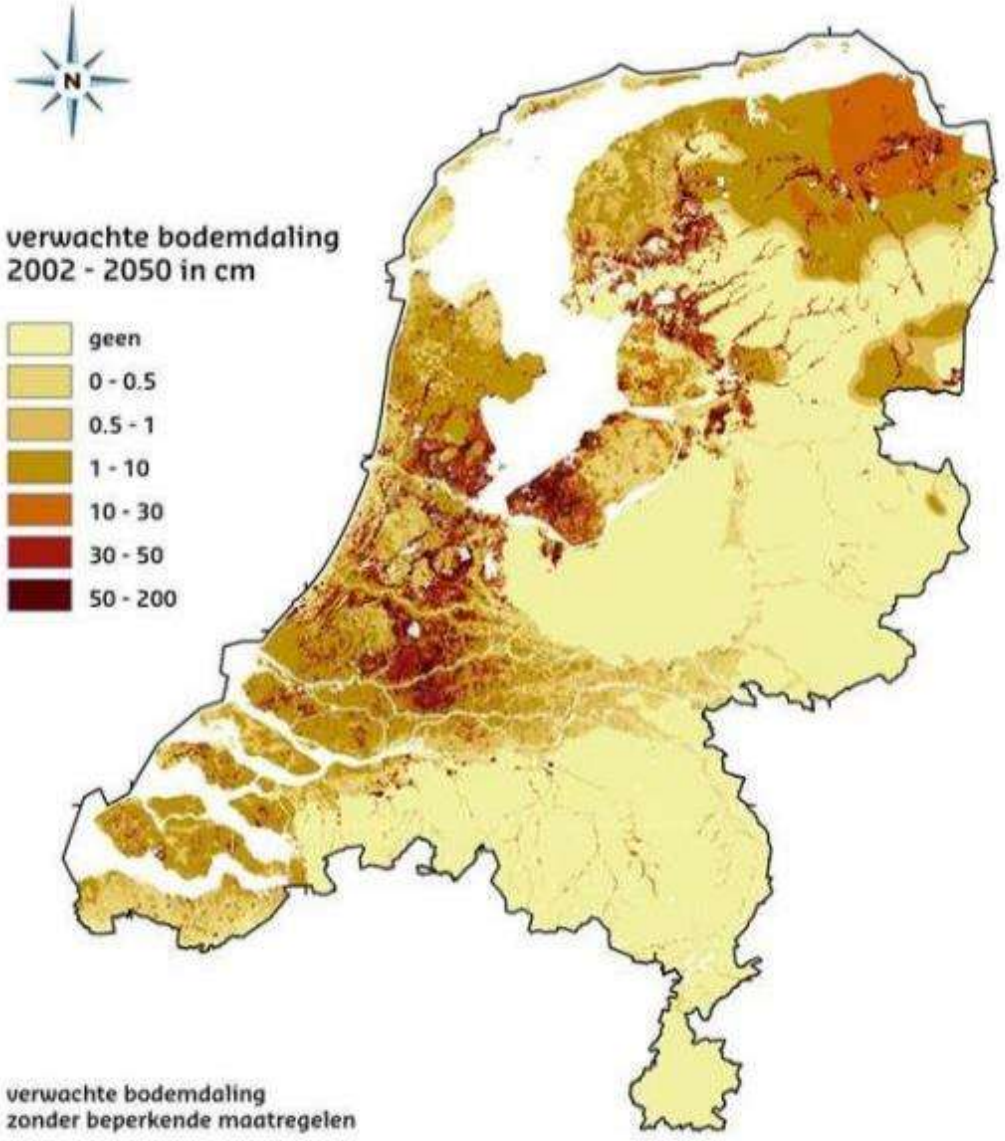

In tropics subsidence 5 times faster!

Whereas the sea level rises, we bog the peatlands down….

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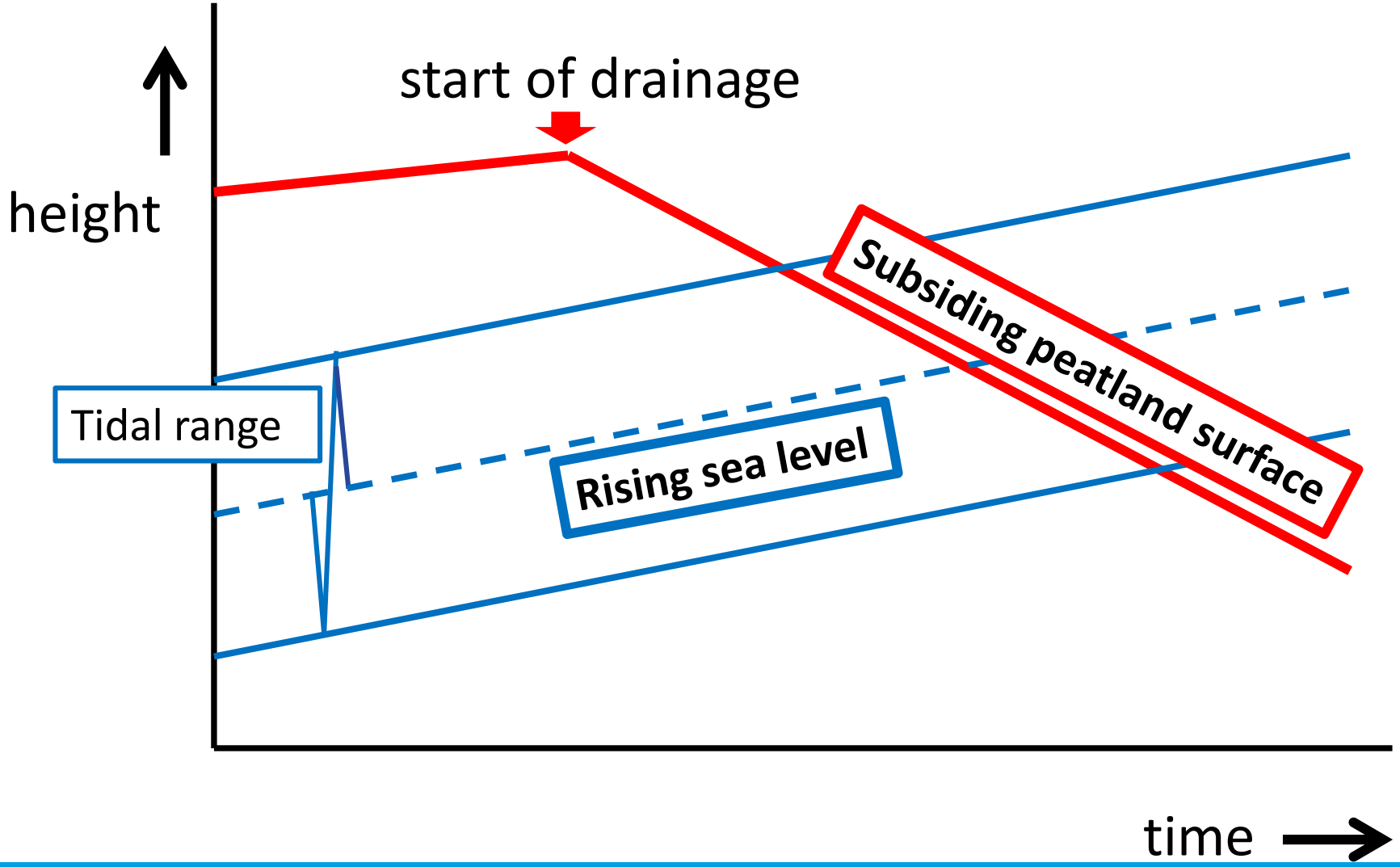
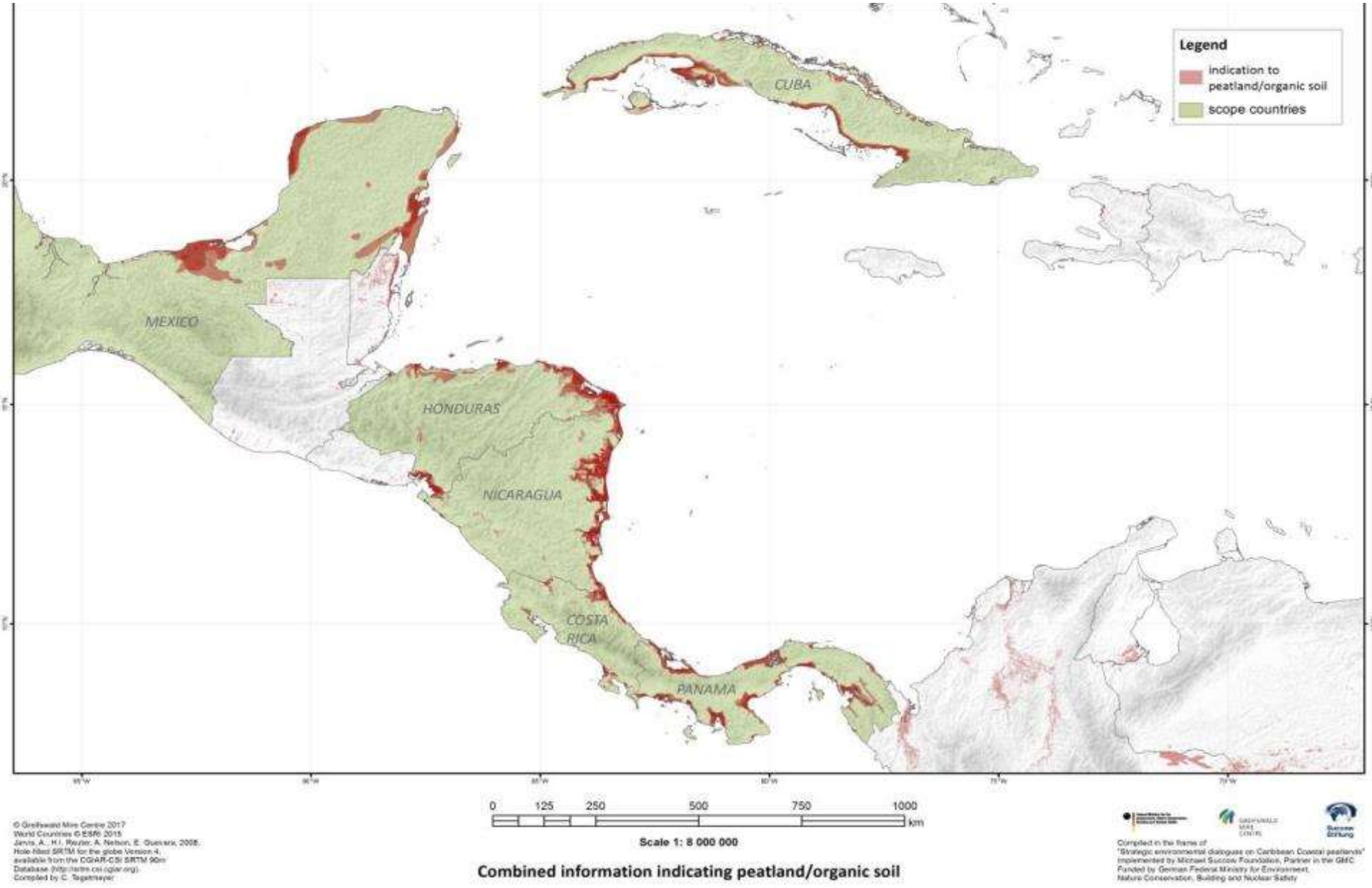
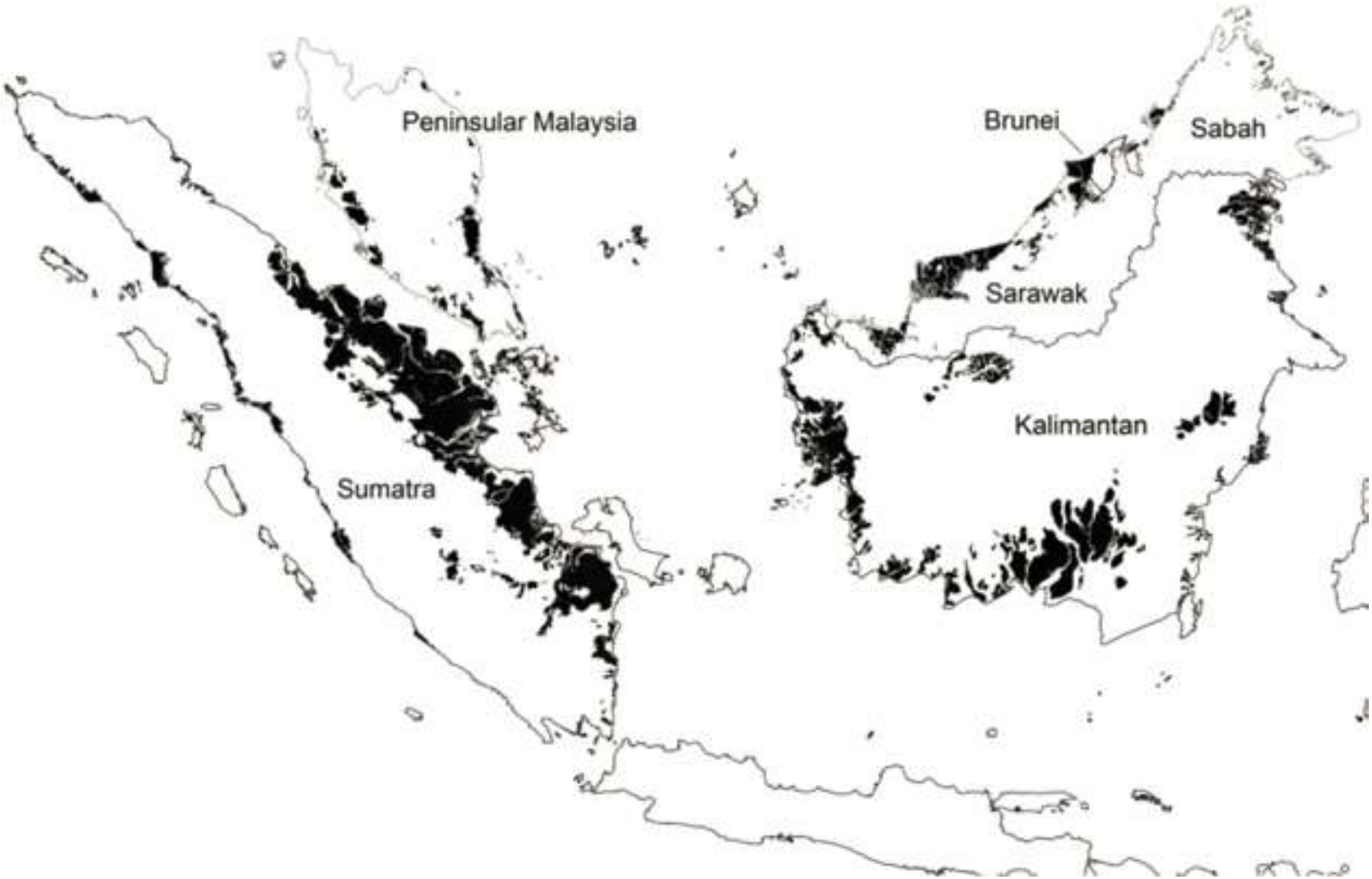


Many peatlands worldwide are coastal and low-lying e.g. in the Carribean…



… and in SE Asia. Many coastal peatlands will - with continuing drainage - be flooded…



Peatland subsidence will in this century lead to uncontrolled flooding of 10-20 million ha of productive land worldwide

We are loosing land, now that we need it most: for more people, for less poverty, and for replacing fossil resources

Kalimantan

Rewet! - Make drained peatlands wet again!

Priority: deeply drained tropical and temperate peatlands

Kalimantan

Change to wet land use! – Paludicultures!

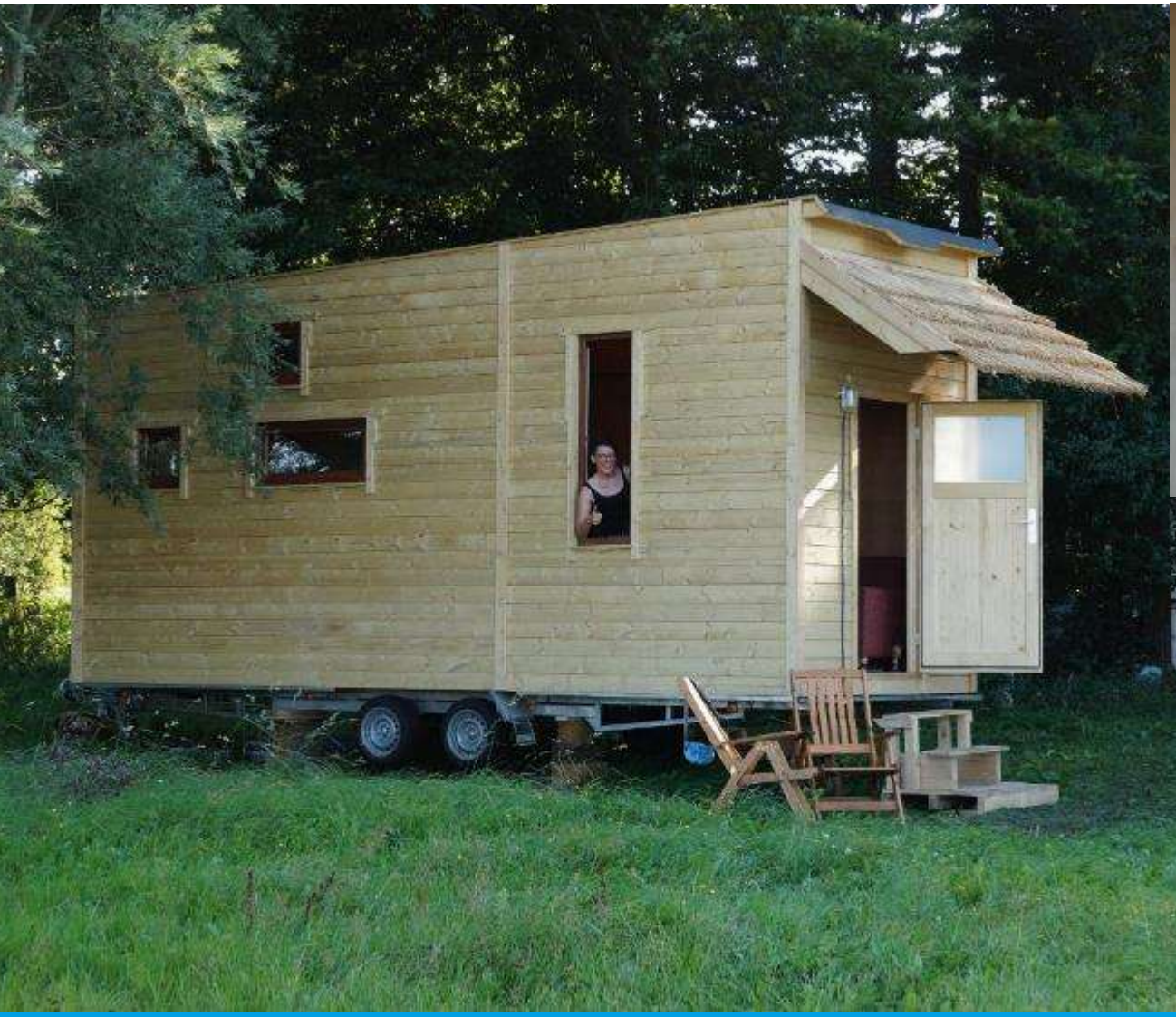
Priority: Intensively used tropical and temperate peatlands

Tobias Dahms, lensescape.org

Papyrus and other reeds: for construction and fuel

Kenya

Paludiculture Mobile Home



What to do and why?

Keep undrained peatlands wet	Rewet drained peatlands	Not rewetable: adapt land use
To avoid more problems	To solve problems	To reduce problems

Where and how?

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Keep undrained peatlands wet	Rewet drained peatlands	Not rewetable: adapt land use
To avoid more problems	To solve problems	To reduce problems
Tropics	Tropics and temperate/boreal zone	
Mapping, land use planning	Develop drainage-free livelihoods, incl. paludicultures	Moist crops, ground cover, no tillage, no N

- Keep wet peatlands wet!
- Make drained peatlands wet again!
- If you use them, use them wet: paludiculture!

Thanks for your attention!

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