Peatlands must be wet: for the climate, for the people, for the future

Implementing paludiculture for sustainable land use

Concluding statement of the International conference „Renewable resources from wet and rewetted peatlands", 26th to 28th of September 2017, Greifswald, Germany

Drained peatlands hamper the achievement of the Paris Agreement and the Sustainable Development Goals. Drained peatlands/organic soils cause enormous economic and environmental losses through greenhouse gas emissions (5 % of global emissions), peat fires, loss of biodiversity, water pollution, soil degradation and desertification, and subsidence (1-5 m per century) followed by an eventual loss of productive land. Almost half of the peatlands in Europe have been drained for agriculture and forestry. In Southeast-Asia, Africa, and America drainage of peatlands is increasing.

It is critical to stop further drainage of intact peatlands to maintain their highly valuable ecosystem services and biodiversity. Rewetting (i.e. raising the water level back to around the surface) solves most problems associated with drained peatlands, but stops conventional drainage-based land use. Paludiculture (i.e. productive use of wet and rewetted peatlands) presents the necessary paradigm shift towards sustainable regional economies with global climate benefits. Instead of draining them, peatlands are kept productive under permanently wet, peat-conserving conditions. Paludiculture is always preferable to drainage-based peatland use: It mitigates climate change and helps adapt to a changing climate in which challenges of sea level rise, droughts, and floods have to be faced.

The second international conference "Renewable resources from wet and rewetted peatlands" (RRR2017, 26-28 September 2017, Greifswald, Germany) brought together nearly 200 experts from all over the world. Over three days they exchanged experiences and ideas, identified research demands, and built networks. The conference showed the impressive progress made since the first conference in 2013. However, several issues still obstruct large-scale effective implementation of paludiculture.

The participants insist that the concept of paludiculture should at the very least entail the preservation of the peat carbon stock (no peat loss) and the minimization of net greenhouse gas emissions. Whether these aims are reached is not determined by the selection of specific crops but by the conditions under which these crops are grown and managed (permanently wet and without damaging the peat soil). Paludiculture may also enhance additional ecosystem services such as water storage, flood control, biodiversity conservation, and nutrient retention.

Whereas partly raising the water level reduces net emissions and subsidence, reaching the goals and implications of the Paris Agreement and the Sustainable Development Goals (zero-emissions by 2050, no loss of productive land) requires peatland water tables to be maintained close to the surface over the entire year.

Until now, most peatlands have been rewetted for nature conservation purposes. To comply with the Paris Agreement, a much stronger emphasis must be placed on rewetting deeply drained peatlands/organic soils currently under high intensity land use. These lands have the highest potential for climate change mitigation, but rewetting these lands implies a transition to new production goals, techniques, and management. Implementing paludicultures will strongly reduce the opportunity costs of the required Climate Action on organic soils. The transition will need to be supported by strong public incentives and investments.

Harvesting peatmoss biomass on a Sphagnum farming site near Hankhausen, Germany. Photo: Philipp Schroeder, lensescape.org

Large scale implementation of paludiculture requires

- Further awareness of direct and indirect stakeholders on all levels and stimulation of inter- and multi-sectoral cooperative action;
- Adjustment of legal frameworks, including stopping incentives which maintain or stimulate peatland drainage, and ensuring accounting for emissions from organic soils under the Paris Agreement;
- Provision of planning security, financial incentives from the public sector (e.g. for rewetting and investments, payments for ecosystem services), and improved access to finance;
- Stimulation and support of innovation along the entire paludiculture value chain, including breeding, cultivation, harvesting, transport and processing technologies, logistics, economy, and markets;
- Encouragement of private sector and multinational corporations to participate in this transformation through investment and Corporate Social Responsibility;

- Bottom-up solutions by engagement of stakeholders/land users, establishment of pilot and best practice demonstration sites, and knowledge transfer, with special attention to decentralised solutions to address the large variety of environmental and socio-economic conditions;
- Further research into paludiculture crops, water levels, and management options to optimize climate and other environmental effects and economic consequences;
- Improvement of the knowledge base of peatland distribution and status worldwide;
- Institutionalisation of paludiculture research and worldwide cooperation

Paludiculture is new and challenging, but with ongoing and increased cooperation between stakeholders (incl. authorities, private sector, farmers, knowledge institutes, conservation organisations), we are confident that sustainable paludiculture solutions can be developed that are beneficial to all parties and the planet.

Harvesting reed near Rozwarowo, Poland. Photo: Philipp Schroeder, lensescape.org

Annex: Drained peatlands and organic soils in the world

Peatlands and organic soils occur in almost all countries of the world, but with a distinct uneven distribution. Most of them are found in the boreal and arctic zones with about 70 % of global organic soils concentrated in Asian Russia (Siberia) and northern North America (Alaska and Canada, Table 1). These lands are largely undrained. Also, 75 % of the undrained organic soils of Europe are located in the northern part (European Russia, Sweden, Norway and Finland).

Many organic soils in Europe are, however, drained, especially in the temperate zone (Table 2). In Asia 64 % of the drained organic soils are found in Indonesia, which also constitutes the largest single source of emissions from drained organic soils globally. The area of drained organic soil has considerably increased in the Tropics over the last years, especially in SE Asia. Most uncertain are the area data for South America and these will likely change considerably with increased awareness and research.

Globally, annual greenhouse emissions from drained organic soils (without peat fires) are 1,600 Mt CO_{2e} (Table 1), i.e. double the amount of CO_2 emissions from aviation. Peat fires from drained peatlands add - in long-term average - another 600 Mt CO_{2e} per year.

Table 1: Total and drained organic soils in the world (Global Peatland Database 2015[1]).

	organic soils			
	total	drained		emissions
continent	km²	km²	%	Mt CO_{2e} yr^{-1}
Asia	1,500,000	195,000	13.0	916.4
Europe	594,000	285,000	48.0	506.8
Australasia	84,000	15,000	17.9	58.4
Nord-America	1,900,000	23,000	1.2	57.9
Africa	118,000	12,000	10.2	51.7
South America	157,000	6,300	4.0	31.2
global	**4,353,000**	**536,300**	**14.0**	**1622.4**

Table 2: Proportion of organic soils drained in selected European countries (Global Peatland Database 2015[1]).

country	% drained	country	% drained	country	% drained
Germany	98	Ireland	83	Belarus	66
Netherlands	95	Romania	81	Latvia	66
Denmark	93	France	73	Iceland	63
Austria	85	Lithuania	72	Ukraine	58
Poland	84	UK	67	Finland*	54

* Finland also constitutes the largest single source of emissions from drained organic soils in the European Union.

[1] Global Peatland Database (GPD) is a project of the International Mire Conservation Group (IMCG) located and maintained at the Greifswald Mire Centre.