Convention on Wetlands

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

Restoring drained peatlands: now an environmental imperative

From trapping and storing carbon, to purifying water and supporting a treasure trove of biodiversity, peatlands greatly benefit people, wildlife, and the environment in a myriad of ways. And although they cover only about 3% the Earth's land surface, the ecosystem services that peatlands provide — and the positive impact that they have on our planet — more than justify their upkeep and our diligent stewardship of them.

Why are peatlands so important?

Peatlands account for roughly half of our planet's wetlands (Tiner, 2009). And they exist in tropical, temperate, boreal, and subpolar zones — distributing their many benefits around the globe.

Peat soils store more carbon than any other ecosystem

- This is because they have accumulated and compacted dead plant material since millennia. This organic carbon is safely stored in peat soils for long periods — if they remain waterlogged.
- Peatlands alone hold 30% of all carbon stored on land — that is, twice the amount stored in all the world's forests.

Peatlands provide living space for uniquely adapted species

- These ecosystems host rich biodiversity and provide refuge for threatened and iconic species — including the last surviving orangutans and specially adapted insect-eating plants.

Peatlands are a cheap, nature-based solution for reducing both flood and drought risk

- Peatlands act as effective sponges and store impressive amounts of water when most needed.
- They absorb rainfall, create wide surface pools, and reduce the flooding of streams and rivers.
- Their water storage capacity also helps safeguard against drought.
- Peat soils can hold up to 90% of water.

WHAT ARE PEATLANDS?

Covering more than 400 million hectares worldwide, peatlands can be found anywhere from high mountains to the sea, and from high to low latitudes. They are a type of wetland — an ecosystem with a peat soil.

Peat itself consists of at least 30% dead and partially decomposed plant remains that have accumulated in their original location under waterlogged, and often acidic, conditions.

Peatlands provide critically important ecosystem services that contribute to human well-being and the natural environment.

Why should we restore peatlands?

As the Earth's most frequently occurring wetland, peatlands play a significant ecological role across the globe — both in terms of the good they do when they remain intact and waterlogged, and in terms of the environmental damage that can occur when human activity disrupts these highly balanced ecosystems.

The restoration of peatlands can resume a cascade of benefits and environmental safeguards

- When people burn or drain peatlands for agriculture, these ecosystems jump from being a beneficial carbon sink to a carbon source. In fact, CO_2 emissions from peatland fires, drainage, and extraction equate to 10% of all annual fossil fuel emissions. Rewetting drained peatlands drastically reduces their emissions.
- Roughly 50 million hectares — that is about 15% of all peatlands — are currently drained and being used for grazing, afforestation, and croplands; for peat extraction; or for infrastructure. These drained peatlands cover only 0.4% of the world's land surface, but they are responsible for 4% (2 Gt CO_2^{-eq}) of all human-induced greenhouse gas emissions.
- Rewetting at least two-thirds of the drained peatlands — that is, 30 million hectares — could help to prevent the combined human land use practices in these areas from becoming a source of net carbon emissions.
- The restoration of peatlands helps meet the SDGs, notably SDG 13 on climate, SDG 15 on biodiversity on land, and SDG 17 on partnerships.
- Rewetting peatlands can significantly contribute to achieving the objectives of the UN Decade on Ecosystem Restoration 2021-2030. Countries should implement large-scale peatland restoration programs. And they should include in their "Nationally Determined Contributions to Achieve the Paris Agreement on Climate Change" emissions from organic soils, as well as emission reductions from peatland rewetting and restoration programs.

Key takeaways

Roughly half of the world's wetlands contain peat soils. The Convention on Wetlands places particular emphasis on peatlands. In its early years, peatland conservation and restoration were done mainly to safeguard their unique biodiversity. Then, it was recognized that peatlands take on important functions in the regulation of the water cycle in river catchments[1]. Most recently, the role of peatlands in climate change mitigation and adaptation, and in disaster risk reduction, has been gaining greater awareness. This heightened understanding has led to several peatland-related Resolutions that have been adopted by the Parties of the Convention — with a strong focus on the restoration of drained peatlands[2].

Rewetting is the most important restoration technique for peatlands. This entails raising the annual average groundwater table to around the peat surface. This must be done by blocking drainage structures — such as ditches, canals, and gullies. If this action is insufficient to re-establish high and stable water levels, the next step would be to establish surface structures — such as bunds, hummocks, and buttressed and stilt-rooted trees — to slow down the outflow of surficial water, thereby creating a water buffer above the peat surface for dry seasons.

Re-establish suitable vegetation. This is vital for protecting the peat body, for re-installing peat formation, for supporting biodiversity, and for restoring adequate hydrological conditions. Re-establishing a target vegetation on drained peatlands may require tree removal, nutrient removal, and/or changing human uses — such as reducing pressure from animal grazing.

Understand that rewetting drained peatlands does not require the abandonment of human uses everywhere. To enhance the welfare of a growing world population, to respond to the increasing demand for biomass, and to replace carbon-based fossil resources — including peat extraction — peatlands can be restored for sustainable productive use. In such cases, existing drainage-based land uses should be replaced with paludiculture, which is the practice of crop production on wet soils. These production methods do not need drainage and offer sustainable solutions for agriculture in wetlands[3].

Make good use of the resources provided by the Convention on Wetlands. As a special contribution to the UN Decade on Ecosystem Restoration, the Convention is publishing in 2021 detailed global guidelines for the rewetting and restoration of peatlands — plus a briefing note for practitioners and a policy brief for decision-makers.

Refer to the peatland restoration and rewetting programs that Parties to the Ramsar Convention have undertaken for best practices and to gain information on what has worked. We all can learn from one another. With each program, we learn something beneficial while re-establishing multiple benefits that peatlands provide for the environment, for local economies, and for individual and family livelihoods. With each program, we make progress in reducing greenhouse gas emissions and in adapting to the challenges of climate change.

1 Ramsar Resolution VIII.17 Guidelines for global action on peatlands

2 Ramsar Resolution XIII.13 Restoration of degraded peatlands to mitigate and adapt to climate change and enhance biodiversity and disaster risk reduction

3 Ramsar Resolution XIII.19 Sustainable agriculture in wetlands

Notable examples of peatland restoration programs

Boreal Peatlands, Finland

Peatlands cover an impressive part of the land in Finland (30%). Although peatland cover in absolute terms is larger in Canada or Russia; the relative values for these countries would only be about 12% and 8% respectively.

Restored edges of a mire complex in the Wetland of International Importance Kauhaneva - Pohjankangas National Park, Finland (Photo: Jari Ilmonen)

Scope of the project

- Recognizing that nearly half of the country's peatland surface had been drained, Finland started peatland restoration programs in 1989, with substantial support from the European Union.
- So far, 28,000 hectares of peatlands have been restored, largely in protected areas that include many Ramsar Sites.

High Andean Region, Central and South America

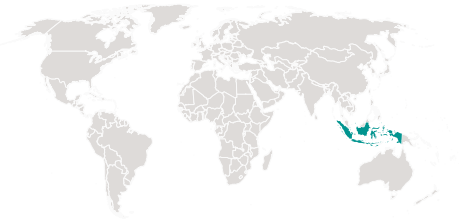
Countries within the High Andean Region of Central and South America understood the impact of peatlands on the local communities there.

Chirripó National Park, Weltand of International Importance Turberas de Talamanca, Costa Rica (Photo: Luis Sánchez A.)

Scope of the project

- The countries cooperating in the framework of the Ramsar Regional Initiative for High Andean Wetlands prepared a good practices guide on how to restore high-altitude peatlands, most notably for the páramo, jalca and puna ecosystems.
- They implemented specific test programs to restore biodiversity and ecosystem functions for the sake of local communities.
- These programs provided useful lessons on the restoration of peatlands in the mountainous areas of Argentina, Ecuador, Costa Rica, and Venezuela.

Tropical Peatlands, Indonesia



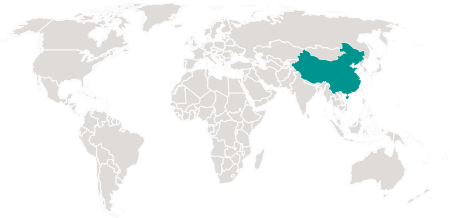
In the wake of the widespread peatland fires in Indonesia in the El Niño year in 2015 – which caused public health concerns there and in neighbouring countries – in 2016, a national Peatland Restoration Agency was established.

Scope of the project

- An ambitious target to restore more than 2 million hectares was set.
- This included the restoration of peatlands that were already conceded for palm oil, pulp, and paper plantations.
- All 2 million hectares would now be used for paludiculture.
- In 2018, a Ramsar Advisory Mission analysed the situation surrounding the Berbak National Park Ramsar Site to identify ways to reconcile biodiversity protection with sustainable land use practices in degraded peatlands.

Drainage ditch block and paludiculture in the surroundings of the Wetland of International Importance Berbak National Park, Indonesia (Photo: Tobias Salathé)

Overgrazed Peatlands, China



The sedge peatlands in the upper catchment of the Yellow River provide breeding habitat for the rare black-necked crane and grazing grounds for traditional livestock farming. Large-scale peatland drainage, intended to increase fodder productivity, resulted in substantial deterioration of the hydrology of these peatlands.

Scope of the project

- Early restoration projects showed that it is essential to understand water flow patterns inside the peatlands.
- Simple flooding may not be an adequate solution – especially where peatlands are exposed to permafrost thawing due to a warming climate.

Peatland Marshes in the Wetland of International Importance Gansu Yellow River Shouqu Wetlands, China (Photo: Administration Bureau China)

This Fact Sheet is made available by the Ramsar Convention on Wetlands 2021. Information is drawn from a variety of publications of the Ramsar Convention on Wetlands including its Scientific and Technical Review Panel or other relevant sources of information.

The Ramsar Convention on Wetlands

The Convention on Wetlands is a global intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.