



SMOKE ON WATER

COUNTERING GLOBAL THREATS FROM PEATLAND LOSS AND DEGRADATION

A RAPID RESPONSE ASSESSMENT





Crump, J. (Ed.) 2017. *Smoke on Water – Countering Global Threats From Peatland Loss and Degradation*. A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal, www.grida.no

ISBN: 978-82-7701-168-4

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A RAPID RESPONSE ASSESSMENT
REVISED EDITION

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Foreword

More than 180 countries have peatlands but we are only just starting to understand their role in both climate change and our efforts to curb it. Peatlands cover less than three percent of the Earth's surface but are the largest terrestrial organic carbon stock – storing twice as much carbon as in the world's forests. In fact, greenhouse gas emissions from drained or burned peatlands account for five percent of the global carbon budget. This first report from the Global Peatlands Initiative highlights why the threat to peatlands from agriculture, forestry, resource extraction and infrastructure development is a threat to the climate.

The Global Peatlands Initiative was created in 2016 because of the urgent need to protect these valuable assets. Leading experts and institutions are now working together to prevent this enormous carbon stock being emitted into the atmosphere. There is still uncertainty about the precise carbon stock value of peatlands because their extent, status and dynamics have never been globally mapped with sufficient accuracy. However, this report shares the knowledge of 30 experts and contributors from 15 organizations to explain both the need and the opportunities to rapidly protect and restore them.

Healthy peatland ecosystems are important to societies everywhere. While many European nations are beginning to see their peat resources as a vital carbon pool, recent discoveries elsewhere are pushing us all into action. For example, last year, an international team of scientists mapped the world's biggest tropical peatland in Cuvette Centrale in the Congo Basin. It contains around 30 gigatonnes of carbon, which is as much as the United States economy emits in 15 years. And, earlier this year, I travelled to Indonesia to learn more about the impact of repeated peatland fires and the ambitious strides the country is taking to tackle them. For people like Thrmrin, a Malay elder, this is not about scientific or political progress; it's about lifting his community out of poverty. Although Thrmrin's grandparents were poor, learning English let him work as a guide, showing tourists the peatland and lake being restored by the community. Now the village has a school and



they are proud to share the culture with visitors, so his own grandchildren have a much brighter future ahead.

I hope that the knowledge and experiences shared in this report will be a practical support for the many governments, businesses and communities working to restore and protect our peatlands. If they succeed, it won't just be the thousands of people who live near them that benefit, it will be the seven billion people who live on a planet that desperately need protection from the impact of climate change.

Erik Solheim

Under-Secretary-General of the United Nations
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The Cuvette Centrale is the world's biggest tropical peatland, located in the Congo Basin. It contains around 30 gigatonnes of carbon, which is as much as the United States economy emits in 15 years.

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Executive summary

Peatlands are among the world's most underappreciated natural treasures. Found on every continent, these waterlogged ecosystems are among the most important carbon reservoirs on the planet.

Composed of thick peat layers of partly decomposed organic material that may have formed over thousands of years, peatlands are highly effective at storing carbon.

If properly maintained, peatlands are wet – it is this waterlogged nature that gives them many of their unique and valuable characteristics, and makes them some of the most efficient terrestrial ecosystems in storing carbon. On average, each hectare of peatland holds 1,375 tonnes of soil carbon – about 10 times more than normal mineral soil (Joosten & Couwenberg, 2008; Parish et al. 2008).

While covering only three percent of the Earth's land mass, they contain as much carbon as all terrestrial biomass combined, twice as much as all global forest biomass, and about the same as in the atmosphere.

Despite the fact that peatlands are often seen as mostly unproductive land, they offer incredible value beyond their carbon storage ability. They provide many “ecosystem services” such as flood control, water purification and habitats for unique and varied biodiversity. Peatland ecosystems support a wide range of plants, birds and animals, including endemic and endangered species – such as the orangutans found in the tropical peatlands of South East Asia, bonobos and western lowland gorillas found in the Congos and the Aquatic Warbler of central and northern Europe. They are also a home to a wide range of native foods, economically important trees, and the peat itself has a long history as a source of fuel.

Peatlands have so far been identified in 180 countries and they occur extensively in both the northern and tropical zones of our planet. They usually form in depressions where water permanently accumulates, either sustained by rainwater or underground sources. A lack of oxygen in the waterlogged environment slows decomposition of organic matter, leading to the accumulation of peat layers. However, across the globe peatlands are under threat from drainage and burning for agricultural, forestry and development uses. Fifteen percent of reserves are currently understood to be either destroyed or degraded.

In this state, peatlands release the carbon historically locked within the layers of decomposed organic matter. They are thought to contribute up to five percent of the global annual

CO₂ emissions. Half the world's peatland emissions come from Southeast Asia where high rates of deforestation, drainage and high temperatures speed up decomposition of the drained peat. Managing the remaining global peatlands is therefore an urgent issue that requires increased research to create a comprehensive inventory of their location and size.

Draining and clearing land for agriculture has been the main threat to peatlands. Historically, Europe has seen the greatest drainage but its expansion has now largely stopped. However, the clearing of tropical peatlands is expanding rapidly, both for agriculture and, in the case of Indonesia, the relocation of landless people to manage population growth and increasing urbanization. Initially, the organically rich peat soil can be highly productive but the generally low level of nutrients means they are quickly exhausted.

Draining peatlands is a method often used to maximize agricultural use of the soil, but this leaves them vulnerable to fire which can significantly increase greenhouse gas emissions. Peat fires can burn for a long time and the smoke carries particulate matter into the atmosphere which can adversely affect human health. Drained peatlands also subside. In coastal areas, this subsidence can lead to salt water intrusion leaving the land completely unproductive and potentially leading to the contamination of the water table.

Ultimately, peatland drainage can have adverse long term economic and social impacts that are more significant than the initial short-term benefits received from land conversion.

Climate change is leading to increasing temperatures, longer and more intense dry seasons and changes in patterns of cloud cover, rainfall and fire frequency. All of this is likely to increase pressure on peatland ecosystems, especially on those that are already degraded.

Yet peatlands can play an important role in climate change mitigation by providing secure long-term storage of carbon. However, to allow them to play this role requires putting an end to their drainage and restoring already degraded peatland areas.

There are a growing number of initiatives around the globe that aim to make peatlands productive without the need for draining. These include the sustainable production of



food, such as fish, feed for animals, fibre and fuel. Peatland management needs to allow for multiple users and activities that are compatible with conservation and restoration. This requires focused action that includes: the development of effective international and national policy, the establishment of fiscal mechanisms and frameworks to support research and conservation activities, and the development and adoption of best practice management.

To help achieve these outcomes, this report assesses the extent of peatlands in the tropics, the threats they face and the action being taken to preserve them.

Main Messages

1. Peatlands are important to human societies around the world. They contribute significantly to climate change mitigation and adaptation through carbon sequestration and storage, biodiversity conservation, water regime and quality regulation, and the provision of other ecosystem services that support livelihoods.

2. Immediate action is required to prevent further peatland degradation and the serious environmental, economic and social repercussions it entails. Existing options to tackle the issue vary, and for that reason implementation should be regionally adapted to local environmental, economic and social needs and characteristics.

3. A landscape approach is vital and good practices in peatland management and restoration must be shared and implemented across all peatland landscapes to save these threatened ecosystems and their services to people.

4. Local communities should receive support to sustainably manage their peatlands by preserving traditional non-destructive uses and introducing innovative management alternatives.

5. A comprehensive mapping of peatlands worldwide is essential to better understanding their extent and status, and to enable us to safeguard them. Research and monitoring should be improved to provide better maps and tools for rapid assessment and transparent use of them to underpin action and multi-stakeholder engagement.



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