



### [Measuring Carbon Stock in Peat Soils](#)

Peatland is one of the largest terrestrial carbon storehouses. However, the carbon it contains is only protected from decomposition by the wet conditions of the peat. Under special conditions where decomposition is slow owing to low oxygen supply (water saturated), low nutrient concentrations, and acidity, dead organic matter from trees or other vegetation can start to pile up and accumulate, creating conditions that further slow decomposition. Specialized trees, sedges and other vegetation start to dominate and a peat swamp forest is formed. When this starts to hold enough water, it can become a semi-autonomous landscape unit, depending on rainfall and atmospheric nutrient inputs, independent of the mineral soil and groundwater. The belowground carbon stocks can reach 10–100 times those of the most lush tropical forest. However, when the forest is cleared and the peat is drained the stored carbon is readily decomposed and released as CO<sub>2</sub>, the most important greenhouse gas. In addition, excessive drainage of peatland increases its vulnerability to fires and, in turn, the peat loses its function of buffering the surrounding environment from drought by the gradual release of water stored in the peat 'dome'. What took thousands of years to accumulate can be burnt within a few days and decompose in a few years or decades.

With the increase of human populations, land resources are becoming scarcer. Peatlands that were once formerly regarded as wasteland are increasingly being developed for various economic purposes such as agriculture and settlements. As a consequence, the carbon sink of

actively growing peat becomes one of the most important carbon sources associated with land uses, land-use changes and forestry. Tropical peat alone is estimated to contribute 1–3% of global CO<sub>2</sub> emissions owing to human activity. In Indonesia, the country that has the largest area of tropical peat, emissions from peatland are around one-third of the total, although the exact numbers are debated and uncertain. Therefore, in the context of Nationally Appropriate Mitigation Actions (NAMAs) and efforts to Reduce Emissions from Deforestation and Degradation (REDD+), conservation and sustainable management of peatland has become one of the main concerns.