

Water

Wise use of tropical peatlands in Borneo

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Borneo contains 18% (ca. 6.5 Mha) of the global tropical peatlands which is a poorly understood ecosystem. Tropical peatlands serve as reservoirs of fresh water, stabilise water levels, reduce storm-flow and maintain river flows that buffer against saltwater intrusion. Peatland swamp forests inherit high biodiversity and provide important habitats for large populations of orang utan. Large-scale land development projects in particular for oil palm plantations will have dramatic environmental repercussions. Drainage for cultivation leads to peat subsidence and oxidation resulting in loss of CO₂, nitrogen and other nutrients and sulphate. An average subsidence rate of 2 cm per year equates to an emission of about 26 t CO₂ ha⁻¹ yr⁻¹. Complete disappearance of peat may be followed by pyrite oxidation that causes widespread acidification of soil and water, whereas frequent fires cast enormous amounts of CO₂ into the atmosphere.

Containing the adverse side-effects of cultivating peatlands calls for proper strategies on expansion or intensification. Our maps for Borneo indicate suitable areas for cultivating oil palm, based on a quantitative analysis of the biophysical conditions accounting for specific peat soils characteristics, potentially acid-sulphate soils, poor drainage conditions, steepness of shallow soils, potential erosion hazard and low water holding capacity. These maps assist the Netherlands Ministry of LNV in her dialogue on expansion or intensification of palm oil production on Borneo, while these insights enable the Indonesian and Malaysian governments to comply with their commitments under several international conventions, in particular the Convention on Biological Diversity (CBD), the Ramsar Convention (RAMSAR) and the United Nations Framework Convention on Climate Change (UNFCCC). The findings have been used to develop guidelines for the wise use of tropical peatlands (www.restorpeat.alterra.wur.nl).

Educational tools have also been developed for the sustainable management of peatlands by the introduction of innovative educational methods and (distance learning) tools. The Universities in Malaysia and Sarawak use these tools to develop curricula and to provide assistance to local government and private organizations to promote “*wise use*” of their peatland resources and enhance sustainable economic development in Borneo. Our work on tropical peatlands has resulted in 4 EU funded projects on the topic.

A decision support system for water management strategies in tropical peatlands has been developed. Land-use scenarios on tropical peatlands in Central Sarawak, Malaysia can be visualised through a web-based interactive system. A try-out version is available through the project website: www.peatwise.alterra.nl.