

Soils, climate change and renewable energy

Reinhard F. Hüttl

Abstract

Soils play a central role in the global carbon cycle. Beside the oceans they are the largest store of carbon, containing 5 times more carbon than all the aboveground vegetation of our planet. Despite this essential function, soils have long been largely overlooked in climate policy discussions. However, recent scientific findings show that human activities, particularly intensive agriculture, progressive soil sealing but also infrastructure measures for the energy transition, are increasingly impairing soils' natural storage and sink functions.

Furthermore, climate change is having a clear impact on soils: rising temperatures including significantly lower numbers of days with snow cover and frost as well as changing precipitation patterns are intensifying the microbial decomposition of organic matter, resulting in accelerated humus degradation and the subsequent release of significant quantities of CO₂.

Current data suggest that CO₂ emissions from soils in Germany amount to over 100 million tonnes of CO₂ equivalents per year, which is comparable to the emissions of the transport sector.

This unexpected development – certainly relevant for Europe and beyond - illustrates the complex interactions between land use, climate change, the carbon cycle and the concept of renewable energy form sun, wind and biomass.