

Tagungsnummer

V223

Thema

Kommission II: Bodenchemie

Freie Themen

AutorenS. Weigand¹, Z. Sebesvari², D. M. Vien³, J. Kruse¹, V. T. Guong³, W. Amelung¹¹Universität Bonn, INRES-Bodenwissenschaften, Bonn, Germany; ²United Nations University, Institute for Environment and Human Security (UNU-EHS), Bonn, Germany; ³Can Tho University, College of Agriculture and Applied Biological Sciences, Dep. of Soil Science and Land Management, Vietnam, Can Tho**Titel**

Topsoil Selling - extreme anthropogenic erosion and its consequences for paddy soil quality (Mekong Delta, Vietnam)

Abstract

Increasing urbanization and industrialization leads to rising demands for construction material, particularly in low-income countries. Thus, agricultural topsoil is sometimes removed and used as raw material e.g. for brick production. Topsoil selling (TSS) is practiced around the world from America, Europe, and Afrika to Asia. In the Mekong, Delta farmers sell the topsoil from their paddy fields to contractors.

The temporal effects of topsoil removal on soil quality are not yet fully understood. We hypothesized that after soil removal, soil quality is significantly lower compared to the original topsoil. To test this hypothesis, we sampled paddy soil chronosequences in two different provinces, ranging between 1 and 8 years after TSS.

Soil organic carbon (Corg) stocks at TSS sites were up to 20 t/ha lower than at control sites (control: 50 t/ha) in Sóc Tr?ng and up to 15 t/ha lower in Trà Vinh (control: 30 t/ha). The C/N ratio was nearly constant around 10. Analysis of inorganic nutrients (e.g. P, K, Na, S, Zn, Cu) showed that changes are variable in space, time and among nutrients. Annual average changes ranged from less than a kg per hectare and year for micronutrients (e.g. Cu, Zn) to several tens and hundreds of kg for macronutrients (e.g. P, S).

The so far available data revealed that TSS induces mainly a dramatic loss of soil organic matter. It was ongoing up to the 8th year of the chronosequences but was not necessarily accompanied by losses in inorganic nutrients. As a result, there appears to be a chance for farmers in the Mekong Delta to overcome risks of soil quality decline after topsoil removal.

Within the next months, we will receive the results from P- and S fractionation and also results from lignin analysis (lignin-derived phenols) will complement to the available data. Thus, we will gain further insights into soil evolution after topsoil selling shortly.