TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Environmental Sciences – Institute of Soil Science and Site Ecology

Effect of clay and pedogenic Fe oxides on stabilization of soil organic carbon in tropical soils of Tanzania

Organic carbon (OC) storage in soil contributes to climate change mitigation, and land use change has a strong impact on OC storage (*Don* et al. 2011; *Scharlemann* et al. 2014). Sub-Saharan Africa is considered as a region where land use change is still increasing in intensity and affected area (*FAO* 2015) which might result in large losses of OC stored in the soil. Clay minerals and pedogenic metal oxides are known to control OC storage and stabilization in soils (*Lehmann* and *Kleber* 2015; *Wagai* and *Mayer* 2007) and thereby affecting potential OC losses by land use changes. Up to now, we do not know whether clay minerals or pedogenic metal oxides are the most influential soil parameter for OC stabilization in weathered tropical soils (Fig. 1). Carbon dioxide (CO_2) production by microorganisms (i.e. soil respiration) will be used as an indicator of OC stabilization.

Figure 1: Soil profile

The aim of the intended MSc thesis is to disentangling the effect of clay minerals and pedogenic metal oxides on SOC stabilization in highly weathered tropical soils of Tanzania. For that purpose, soil samples from two contrasting land uses (near natural forest vs. annual cropping) will be used for an incubation experiment to determine soil respiration. These soil samples have strongly contrasting contents of oxide-free clay (proxy for clay minerals) and pedogenic Fe oxide (proxy for pedogenic metal oxides).
For this MSc thesis research, we are looking for a motivated student interested in soil analyses/research. To have a basic understanding in soil science, statistics, and lab work are desirable.

Supervisor: Prof. Karsten Kalbitz, Maximilian Kirsten
Contact: Maximilian Kirsten
Maximilian.kirsten@tu-dresden.de
Phone: (+49) 351 463 -31368

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