PROF. DR. BARBARA REICHERT

Hydrogeology

Interaction between groundwater (at catchment and wetland scale) and wetland water are identified, the proportion of groundwater in the wetland is quantified, the water quality along its flow paths and along the use gradient is determined, and the water quality with respect to both human consumption and food production is evaluated. Geological and hydrogeological characterization of the wetlands and their catchments will be performed in order to delineate groundwater flow paths and to define possible chemical indicators for ground water admixture. Seasonal snapshot sampling of the various water types within the wetland, and the contributing affluxes from the catchment area with on-site measurements (electrical conductivity, pH, temperature, redox potential, oxygen content, bicarbonate and carbon dioxide), laboratory analyses of major cations and anions, and selected key indicators for groundwater (e.g. trace metals, F^-, H_2SiO_4), and isotope tracer (^{18}O, ^{2}H, ^{3}T), will provide an overview of the spatial and temporal variability of the water quality, and of the proportion of groundwater within the wetland water (Owor et al., 2011). Selected organic parameters (waste water admixture, pesticide application) will be analyzed site dependently. In order to understand the dynamics of the mixing processes, regular sampling of selected hydro chemical and environmental tracers will be performed in transects across the wetland. Accompanied by a tracer-based residence assessment, inverse modeling (PHREEQC) will be applied to determine the chemical evolution of wetland water, and to assess the mass flow between various compartments of the wetland. An assessment of the water quality with respect to human health will also be performed.

Additionally research regarding (1) analysis of the changes in water quality due to alternative management methods; (2) spatial and temporal quantification of the variations in the proportions of the different water components (groundwater, surface water); (3) evaluation of the changes in water quality with respect to both human consumption and food production will be carried out.

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Cluster	A, B, C, D, E
Work Package	A1, A5, B2, C1, D2, D3, D4, D5, E
Countries of work	Kenya, Tanzania, Rwanda, Uganda
Institute	Steinmann Institute of Geology, Mineralogy and Palaeontology
University/Organisation	University of Bonn