

PhD projects at the Research Group of Plant-Soil-Atmosphere Exchange Processes

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Impacts of Land-Use Changes on Greenhouse Gas Emissions from Wetlands in Uganda and Tanzania

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This PhD research project investigates the impacts of land use changes on greenhouse gas fluxes from wetlands in Uganda and Tanzania. This thesis is part of the GlobE-Project “Wetlands in East Africa” Work Package B2.

Wetlands can act as sink or source for greenhouse gases. On the one hand, the high primary net production of organic matter in combination with low decomposition rates under anaerobic conditions lead to increased rates of organic matter accumulation and carbon sequestration. Thus, wetlands are known to be sinks for carbon which results in reduced carbon dioxide emissions. On the other hand, high rates of microbial activities can also lead to increased trace gas productions (Reddy and DeLaune, 2008). Although the proportion of wetlands on the earth’s terrestrial surface is comparatively low, they have the ability to influence the greenhouse gas budget on global scale.

To estimate the fluxes of carbon dioxide, methane and nitrous oxide from agricultural used and natural wetland areas, static chamber measurements will be applied. In addition, the LICOR Li8100A System will be used as reference for the observed CO₂ fluxes. This study aims to investigate the different greenhouse gas fluxes of diverse agricultural treatments and to compare them with the emissions of (semi-) natural wetland areas. The results will be used as an indicator to evaluate the sustainability of alternative wetland use options.



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2 nd Supervisor	Prof. Bernd Diekkrüger
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