

## Master projects at the Research Group of Crop Science and Resource Conservation

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# Seasonal soil N dynamics and contribution of valley slopes to matter fluxes in wetlands of Uganda

**Keywords:** Africa, N dynamics, soil moisture, soil geochemistry, soil physics, Uganda

The Master research presented investigates the N mineralization dynamics and the water and nitrate contribution from valley slopes in wetlands for the Namulonge site. It is part of the GlobE-Project “Wetlands in East Africa- reconciling future food production with environmental protection”.

As traditional African farming systems are mainly upland based and subsistence oriented, the amount and availability of nitrogen has become the most limiting factor for crop growth and is responsible for stagnating and declining yield trends. There is a need to use internal N resources (native soil and biological fixed N) more efficiently and expand farming to unused lowland swamps that hence a production potential. With high year around available moisture and generally with soils that are more fertile and N-rich, wetlands may become the food basket of the region. Despite this production potential, the Birch effect (N mineralization peak with onset of first rains) and subsequent N losses from wetlands are hypothesized to be highest during the transitional period and will require intervention strategies to manage this native soil N.

In terms of the Master research project the temporal N dynamics during the transitional period of 2014 will be determined. Furthermore spatial effects of valley slopes to water and Nitrate dynamics into the wetland will be quantified. The effect of slope contribution to crop production potential will be assessed. These informations will guide future intervention strategies on native soil N conservation by nitrate catch crops (transition season legumes) and temporary N immobilization in the soil microbial biomass (residue management).



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Work Package	
Countries of work	Uganda
1 <sup>st</sup> Supervisor	Prof. Dr. Mathias Becker
2 <sup>nd</sup> Supervisor	
Subject	Geosciences
Faculty	Faculty of mathematics and natural science
University	Rheinische Friedrich-Wilhelms-University Bonn
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