

PhD project at the Department of Plant Nutrition

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Modelling production potentials and constraints of rice and maize cultivation in East African wetlands for the identification of sustainable and applicable agricultural intensification strategies

Keywords: Dynamic crop modelling, Yield gaps, Potential vs Actual yields, Wetlands, Tanzania, Uganda

This PhD project seeks to investigate the major drivers and constraints of rice and maize production in East African wetlands.

The objectives include the identification of sustainable agricultural intensification options on the basis of detected production potentials and constraints. Assessed options include conventional inorganic as well as alternative organic intensification strategies.

Findings of this project aim to support the development of a decision making tool to guide agricultural wetland use.

Dynamic crop models such as *APSIM* and *ORYZA* are applied to estimate potential yields and quantify the yield limiting factors under controlled constraints. Dedicated yield gap trials are established in Tanzania and Uganda for model calibration and validation under known boundary conditions.

Actual farmer's production environments are assessed and attainable yields recorded in cooperation with *AfricaRice* using standard protocols.

The data will be used to, additionally, test the models' applicability for actual production situations.



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Work Package	WP A2: Potentials, Uses, Constraints
Countries of work	Tanzania and Uganda
1 st Supervisor	Prof. Dr. Matthias Langensiepen
2 nd Supervisor	Prof. Dr. Mathias Becker
Subject	Agronomy
Faculty	Faculty of Agriculture
University	University of Bonn
Working period	04/2015 - 08/2018