

Modelling Risk and Uncertainty in Flood-based Farming Systems in East Africa

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Introduction

- Flood-based Farming Systems (FBFS) sustain the livelihoods of millions of farmers in East Africa.
- FBFS can be highly productive, but can also be risky and labour-intensive.
- Since FBFS differ strongly from regular agricultural settings, results from many studies, (for example common crop models) cannot be applied.
- We attempted to develop customized solution-oriented crop models for FBFS using the principles of Decision Analysis (Luedeling & Shepherd, 2016).

Principles of Decision Analysis

- Consider all factors that seem important
- Integrate expert knowledge with other information
- Fully consider uncertainty, rely on the actual state of knowledge, not on assumptions

Materials and Methods

- Model development through inputs from local and international experts, and consideration of scientific literature



In a flood-based farming system, seasonal floods are diverted and used to irrigate agricultural fields

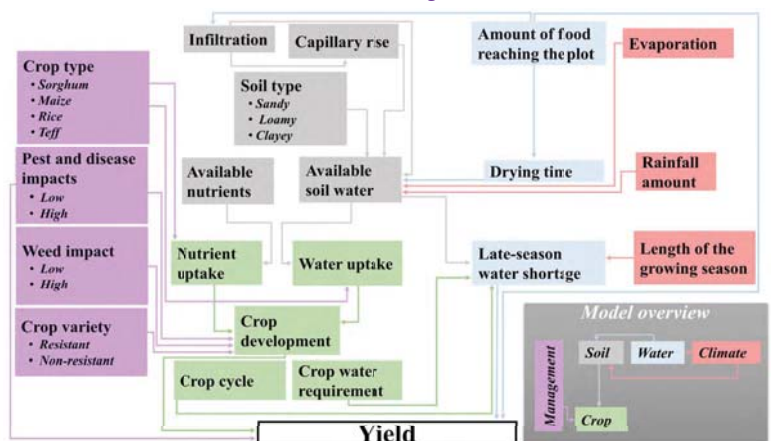


Flood-irrigated rice paddy in Western Kenya



Water diversion structure in a modern FBFS in Tigray, Ethiopia

Preliminary results



Outlook

- Risk assessment and identification of critical uncertainties
- Probabilistic yield projections for FBFS in Kenya and Ethiopia (as in Luedeling et al., 2015)
- Apply model for ex-ante projection of flood-based farming interventions

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Luedeling et al., 2015. Front. Environ. Sci. 3:16.



Luedeling & Shepherd, 2016. Solutions 7(5):46-54.