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Hitting the (fuzzy) mark: Targeting interventions and scaling out successes

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Session: Spatial Analysis and Modeling

Key Message

We are building a web-based tool that takes indirect evidence about factors of success and assesses the likelihood of successful outscaling, while taking congnisance of the underlying uncertainty associated with the predictions. Successful adoption of water management interventions requires suitable biophysical and institutional conditions, and sufficient human capacity.

Summary

We are building a web-based tool to produce maps of the likelihood of successful adoption of water management interventions such as water harvesting, drip kits and irrigation. This is a substantial challenge because success depends on suitable biophysical and institutional conditions, and sufficient human capacity; data on these factors is scarce and evidence from field trials and pilot tests is mixed.

The conceptual model motivating the tool is that interventions have identifiable factors of success (or failure), where we currently take "success" to mean improved food security. Factors may not be directly observable—for example, "local capacity to maintain the system"—but can be inferred from

indirect evidence drawn from already-available data, such as a labor survey. We have completed expert consultations in the Limpopo and Volta basins on interventions, factors of success, and indicators. Provisional analysis suggests physical, human, and institutional issues are the dominant determinant of success and failure. Also, while success stories are scarce, researchers seem to know what can work in different contexts.

Given the uncertain data and links between evidence, factors, and success indicators, we are implementing the model as a Bayesian network. Bayesian networks use "fuzzy" probabilities, rather than sharp values, and can accept both quantitative and qualitative information. The model will be informed by case study data where possible, supplemented by expert knowledge. The tool will accept data layers that provide indirect evidence of factors of success. We are currently building the infrastructure, designing and implementing the tool logic, and collecting data.