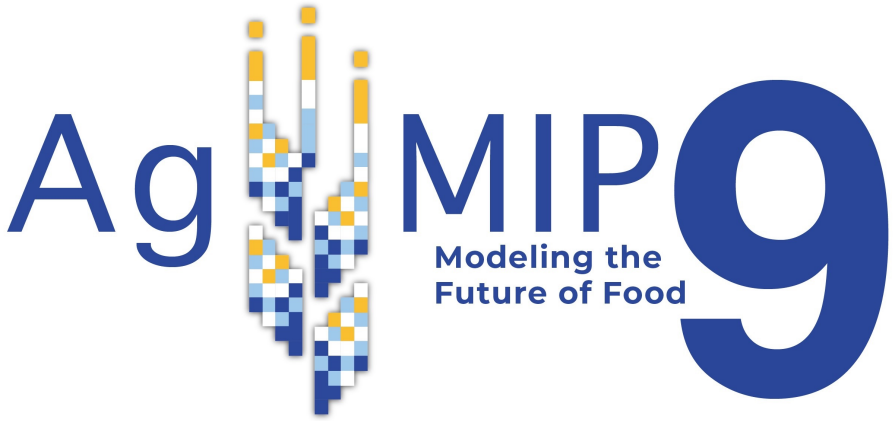

Participatory Agent-Based Models: A Senegal Climate Adaptation Case Study

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Case Study Overview

Motivation

- Climate change may lead to unanticipated shifts in migration patterns, esp in West Africa
- Effective policy responses require synthesis of diverse bodies of knowledge

Research questions

- (Co-created): How do different potential investments fare in improving rural Senegalese livelihoods?
- (Methodological): What are useful ways to engage stakeholders in participatory agent-based models?

Key method: Participatory agent-based models

- Simulate interactions among individuals & environment (e.g. livelihood choices) in order to assess emergent behavior (e.g. migration flows)

Co-Creation Process

Kick-off Workshop (May 2022, in person)
- Build shared understanding of systems models
- Draft research questions
- Identify available data

First validation workshop (Oct. 2022, online)
- Discuss ABM framework
- Prioritize scenarios and validation strategies

Second validation workshop (May 2023, online)
- Present initial model and data results
- Discuss detailed validation questions
- Discuss refined scenarios

Final workshop (Winter 2024?, in person)
- Present model validation and scenario results
- Discuss next steps for publications, policy use

Participatory Modelling Opportunities

Better questions

Co-create research questions and scenarios of interest

Better model skill

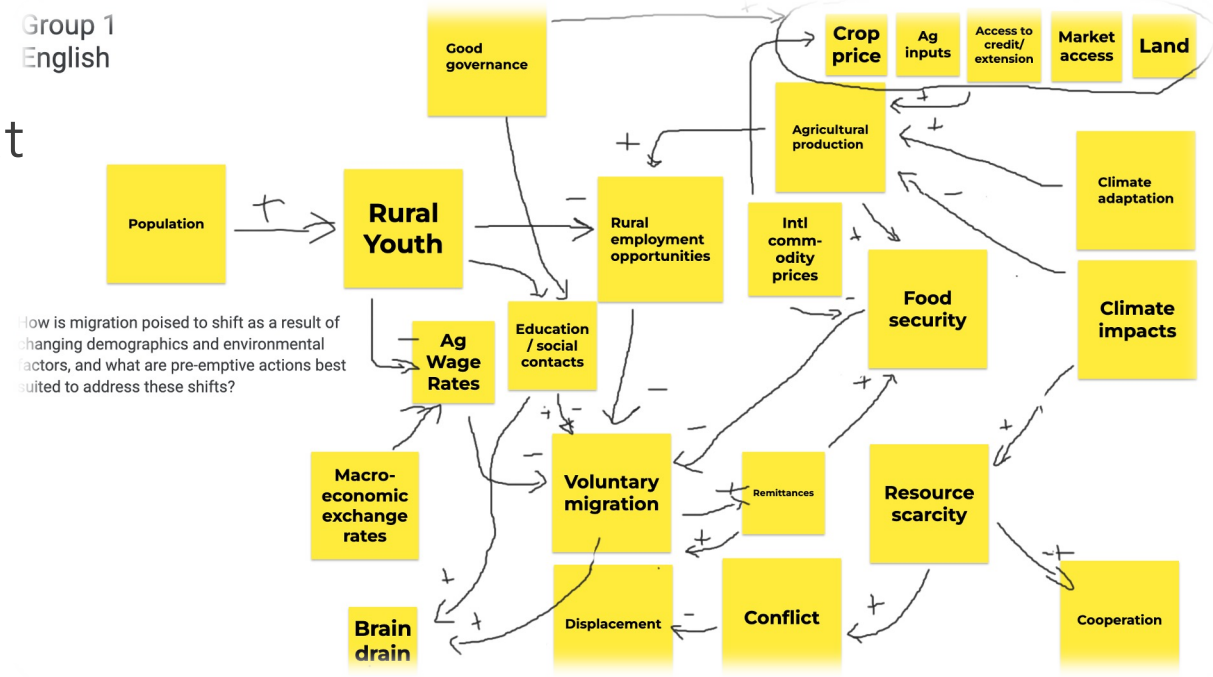
Incorporate more realistic assumptions about human decision-making and interactions

Better trust

Prioritize outcomes that model should replicate to build trust

Better use

Incorporate models and model results in policymaking



Participatory Modelling Challenges

How to build stakeholder trust in imperfect model?

- No model can perfectly replicate complex social-ecological system
- Stakeholders may diverge on what model components are most important to get right

How to incorporate diverse types of stakeholder information?

- Mismatch in temporal, geographic, and issue coverage among different datasets
- Deep (and valuable!) ethnographic work has been difficult to incorporate in computational model

What does successful co-creation look like?

- Initial hope: ABM actively used by policymakers
- Current objective: ABM serves as a platform to coalesce insights from diverse geographic/domain experts