Adaptive investment pathway for farmer security: Group modeling of sand river socialecological systems of Eastern Africa

Prasad P., Karimi P., Kiptala J., Mwangi M., Yazew E., van der Zaag P.

Dr. Pooja Prasad IHE Delft Institute for Water Education ISDC July 2020











Context

- Arid and Semi-Arid regions of Eastern Africa
- Variable water availability due to climate change, dry spells
- Sand rivers: untapped potential to support life and livelihoods, especially smallholder irrigation
- Project objective: Increase farmer resilience to climate change through sustainable fresh water access







Olkeriai and Tiva rivers, Kenya



Adaptive investment Pathways

- Incremental investments in water storage to account for an uncertain future
- Rooted in systems thinking: recognizes that the system adapts and plans for various scenarios



Figure 1: Steps for Adaptive Investment Pathway (adapted from Haasnoot et al. 2013)





Participatory systems modeling activity

- Stakeholders from government, non-govt bodies, community, academia from Kenya and Ethiopia
- Objective: develop a participatory group model to represent the sand river based small holder farming system
- Why?
 - A common language to capture mental models of a diverse stakeholder group
 - To develop a structural understanding of the system





Group Modelling Process



Inspired from Omidyar (2012) Systems practice workbook





Participatory group modeling















System structure and feedbacks



Simplified CLD with key feedback loops driving the systems dynamics (Aha! moment)







Profitability by intensification: a core project assumption!

















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Conclusion and Next steps



- Systems model validated the step-wise adaptive approach to investment in water infrastructure
- Identified possible risks to be taken into account
- Next steps: Development of a quantitative SFD model for scenario analysis





Thank you



Contact: p.prasad@un-ihe.org





Module 1: Explore variables

- Framing question: What forces account for the current situation of small-holding farmers in sand river systems?
- >100 variables collected, filtered to 40
- 5 sub-systems emerged







14





