



**Harnessing floods to enhance
livelihoods and ecosystems**

Vision



investments in land and water development

- are sustainable and equitable
- informed by open dialogue and cooperation based on transparent and publicly shared scientific analyses
- integrate ecosystem services and gender perspectives

What



- Explore how to optimize the **use of floods for agriculture and ecosystem services** to support livelihoods in different landscapes and socio-economic settings in Sudan and Ethiopia.

Why FBFS



- Flood-based Farming Systems (FBFS) use floods to grow crops, fodder & recharge shallow groundwater.
- Contribute to local food security and economic development, poor beneficiaries
- Only source of water in semi-arid
- Total of 30 million ha, often serving poor farmers.
- Estimated at 550,000 ha in Blue Nile Area
- High risks (unpredictable floods, high sediment loads and frequent changes of riverbeds).

Problem statement



- Sudanese and Ethiopian gov't started investing in the improvement of infrastructure (weirs, intake and canals) and on-farm practices to enhance agricultural productivity.
- Unknown how these interventions at scheme level interact with other functions provided by floods at the local and landscape level
- Unknown how these interventions affect livelihoods of different stakeholders, particularly rural poor women.

FBFS ecosystems



- Linked to biodiversity and natural vegetation.
- Floods collect seeds from large catchment and deposit them in moist soils.
- Floods feed ephemeral wetlands rich in species.
- Natural vegetation provides additional sources of income to local communities
- But invasive species(mesquite) could negatively affect agricultural production

FBFS ecosystems (2)



- Diversion and conveyance structures in FBFS stabilize ephemeral rivers. FBFS can also reduce flood damage.
- Large floods (too big to handle)
 - guided to groundwater recharge basins
 - reservoirs for domestic and livestock water supply
 - spread over large outwash areas serving as rangelands.
- Need to account for ecosystem services and multi-functionality.
- Need to know impacts of interventions

Landscape approach



- FBFS are affected by development elsewhere in the sub-basins and landscapes.
 - For example, upstream watershed improvement to enable agricultural activities in the degraded hills in Tigray can smoothen peak flows and reduce sediment loads.
 - Sudan: interventions in upstream system affect downstream “Gash die”

Include stakeholders



- From start to finish
- From farmers to decision makers at all relevant levels
- Male, female, youth
- Those who benefit, and those who may loose

Where



Sudan

- Gash area
- Spate irrigation systems very old
- Improvements in Gash system upstream-downstream

Ethiopia

- Tigray
- Spate irrigation relatively recent acceleration
- Impact of upstream interventions on downstream spate irrigation

How



- Research for development
- Responding and adding value to ongoing decision making
- Inform ongoing or planned interventions with science based insights
- Basin perspective: impact of local intervention on larger landscapes
- Incorporate gender and ecosystems approach

Research



Question 1:

- What is the impact of current investment plans of upstream agricultural development on downstream flood based farming systems and livelihoods, in particular for women?

Question 2:

- What is the added value of incorporation of gender and ecosystems perspective in investment plans in flood based farming?

Question 3:

- What is the most 'efficient' use of floods (from different angles) in the Raya watershed and valley and Gash basin? And what interventions and set of intervention support this?

3 steps



- 1) assessment of the baseline situation, separate for men, women and youth;
- 2) Impact assessment of proposed interventions; and
- 3) formulation and evaluation of alternative scenarios exploring trade-offs and synergies between benefits, costs and their distribution over stakeholder groups and the environment.

Outputs



- Importance of gender and ecosystem approach in FBFS development is endorsed
- Intervention methodology developed and applied that includes gender and ecosystem services as well as identification of basin-wide winners and losers and trade-off analysis
- Gender and ecosystem approach into curriculum of UNESCO-IHE, Mekelle University and Sudan Gezira University/Hydraulic Research Centre

Who

Consortium partners

- The Institute of Water and Environment, Mekelle University, Ethiopia.
- The Hydraulic Research Centre of the Ministry of Water and Electricity, Sudan.
- UNESCO-IHE Institute for Water Education, the Netherlands

and all of you