

Serious games around water in Tanzania

Leon Hermans

30-06-10

This research seminar

Case of water resources conflicts in Tanzania

Looking at a water conflict as a game

- Analyzing conflicts as games adds to subject-experts' advice
- Challenge for policy analysts is not only to analyze games, but to design games

To be continued in a next seminar on 'negotiation analysis'

Location map Rufiji River Basin in Tanzania

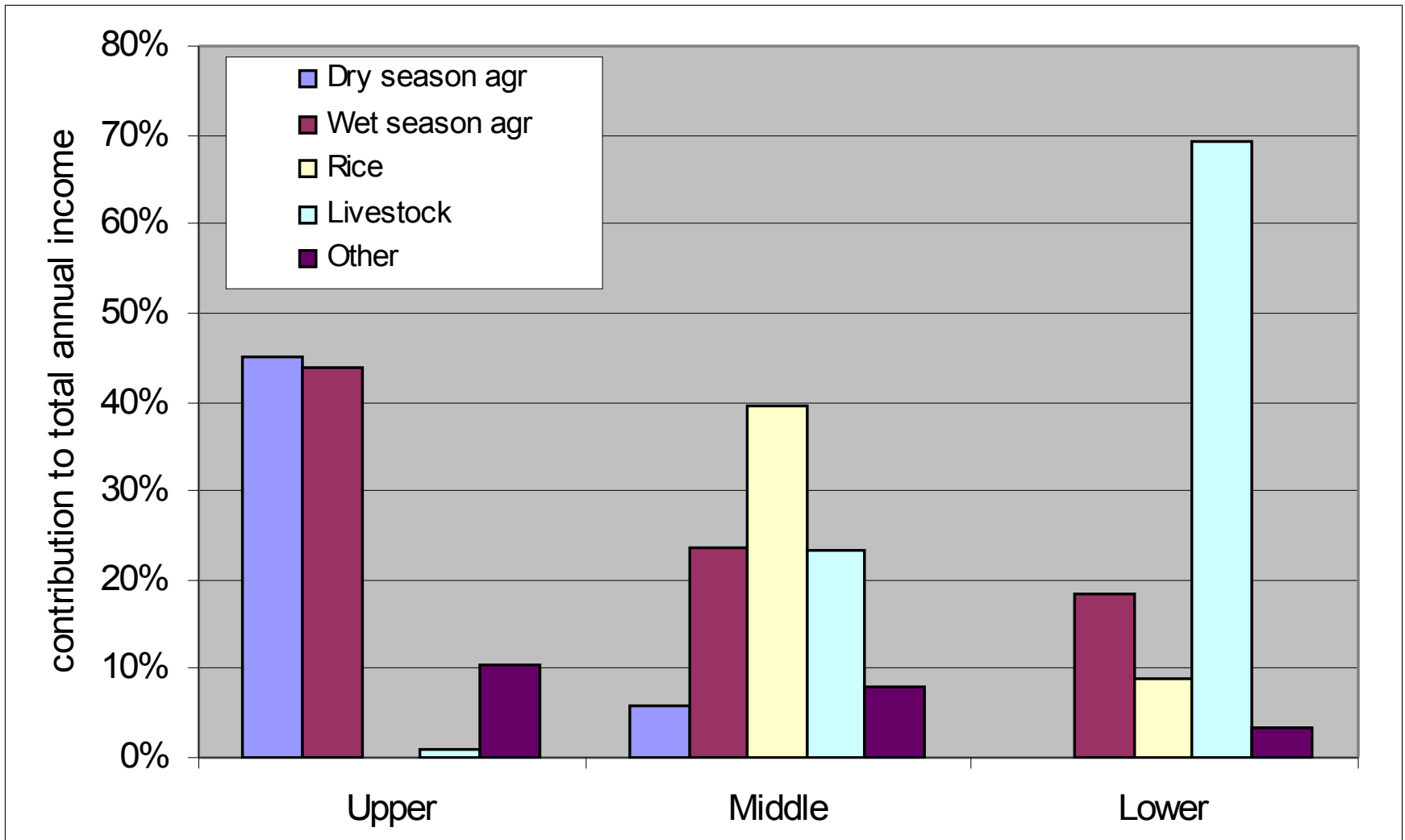
Case study focuses on Mkoji sub-catchment, in Mbeya region



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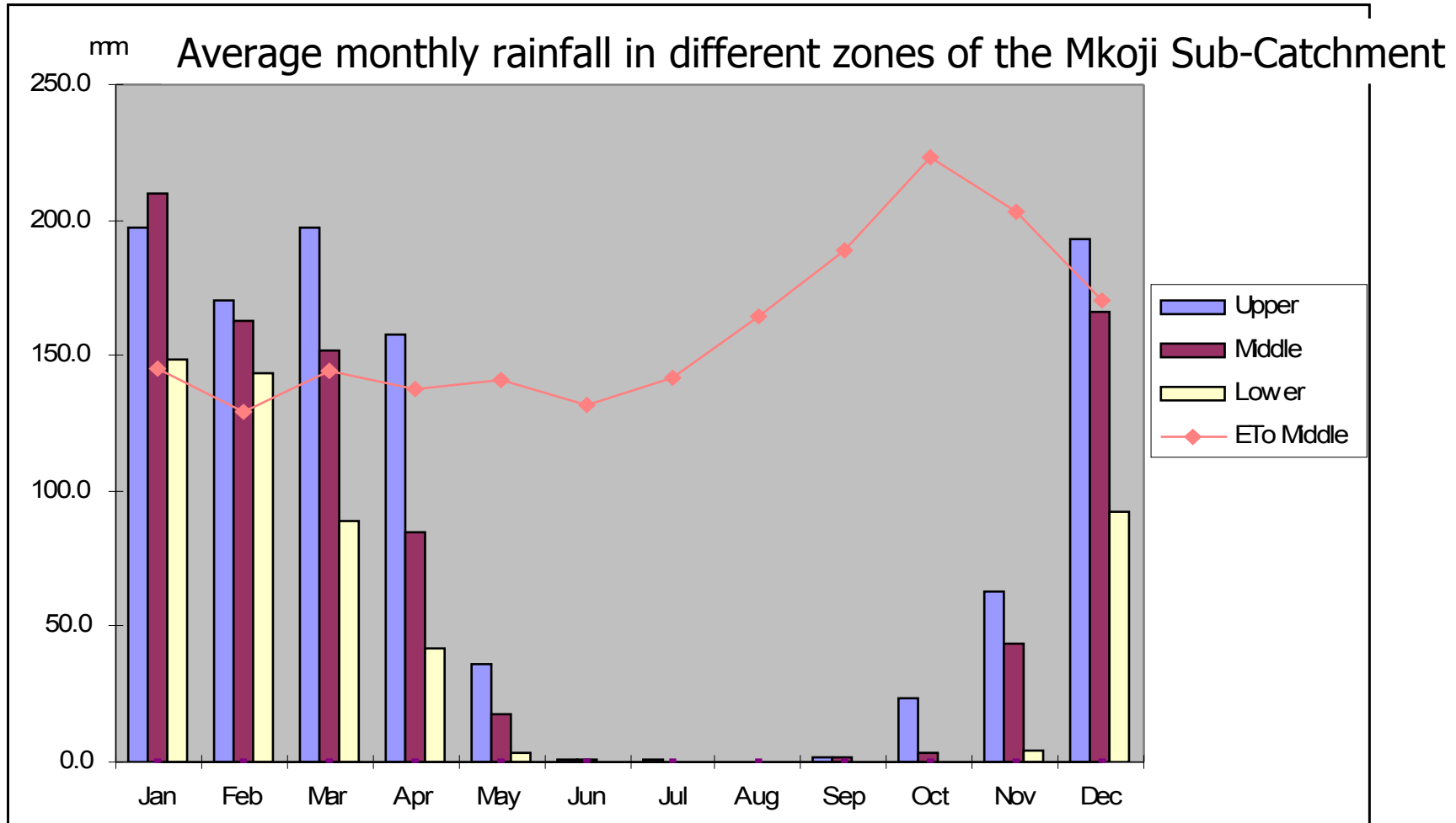
Picture in public domain (us government works)

Sources of income



Water scarcity

A seasonal source of conflict



Early in the wet season:
transplanting rice in
upper/middle parts



Early in the wet season:
still waiting for water
further downstream



Conflicts over water: water for rice

- Conflicts over irrigation water peak at the onset of rainy season: race to secure water for paddy and early 'transplantation'
- Conflicts worsened over the years by increased water abstractions for irrigation (expansion and irrigation modernization)
- Armed fights and court cases

- Players:
 - Top-end irrigators (upstream) vs
 - Tail-end irrigators (downstream)
- Pay-offs:
 - Water to grow rice (timing and volume)

Strategy proposed by water experts: “Save and share”

- Establish joint water rotation schedules in communities: ‘taking turns’
 - Results in a zero-sum game, ‘winners’ and ‘losers’ – distribution of a fixed pool of water resources over an increasing demand
 - Enforcement proves problematic
- Improve water use efficiency
 - Irrigation improvement, improved seed varieties, on-farm water management, etc. No longer zero-sum.
 - Ample room for improvement, but implementation proves difficult and shows mixed results (and negative externalities further downstream...)

Note that this is a ‘cooperative’ strategy that requires self-organization and cooperation.

Strategies for the players

- Top-end irrigators:
 1. Save and share water through options for rotation and increased water use efficiency (advised by water experts)
 2. Take water as required and available in irrigation schemes
- Tail-end irrigators:
 1. Save and share water through options for rotation and increased water use efficiency (advised by water experts)
 2. Illegally divert water to fields

How the game is played

- Top-end irrigators:
 1. Save and share water through options for rotation and increased water use efficiency (advised by water experts)
 2. **Take water as required and available in irrigation schemes**
- Tail-end irrigators:
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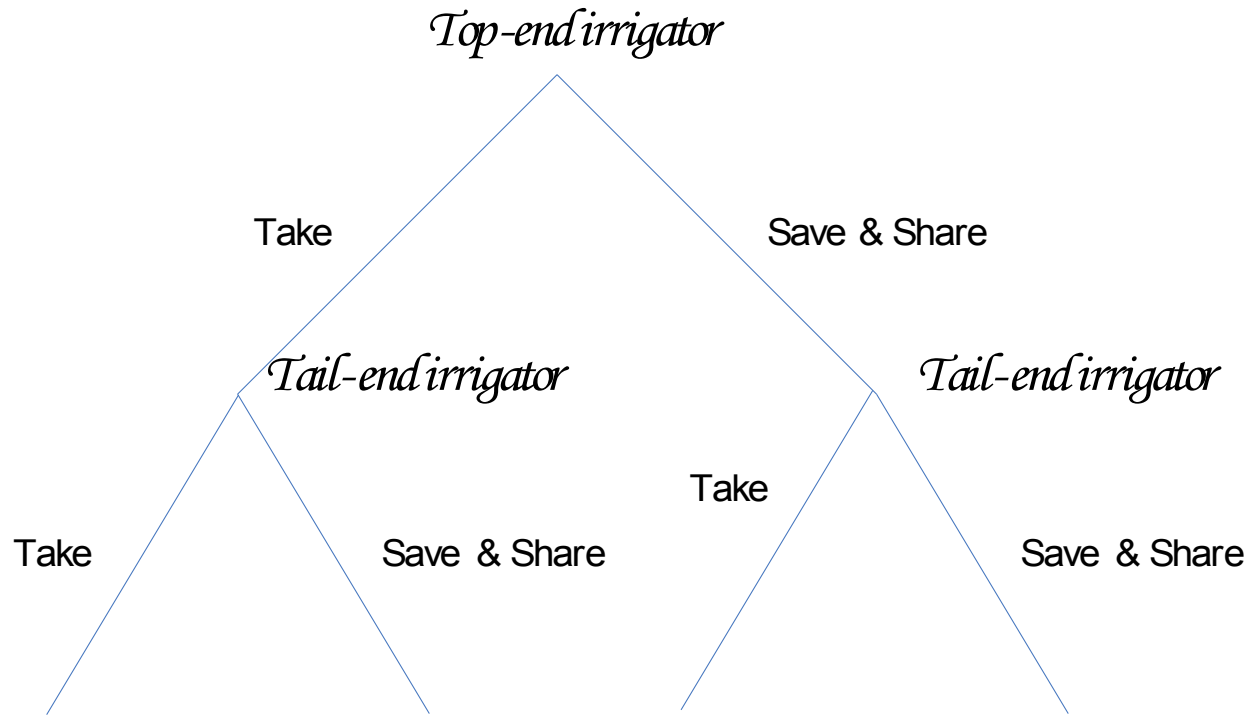
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What is happening here?

- Does game theory help you to interpret the conflict? If so, what does it tell you?

Game tree representation



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