



# **Water in Africa: Hydro-Pessimism or Hydro-Optimism?**

# **Água em África: Hidro-pessimismo ou Hidro-optimismo**

**Centro de Estudos Africanos da Universidade do Porto**  
Porto, Portugal, 2-3 October 2008

# Water Security in rural Tanzania

## Social Status and Distributive Conflicts in Irrigation Systems: A Field Experiment

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# Access to irrigation water

- Controlled access to water essential for agriculture
- Self-governed 'traditional' irrigation in SSA
- Local common pool resource institutions
  - Efficient?
  - Sustainable use?
  - Equitable distribution?



# Research questions

- How are distributive conflicts dealt with?
- What is influence of local power structure?
  - Does appropriation behavior of upstream users differ according to their relative social status position in society?
  - Is 'right enforcement' behavior of downstream users different according to their relative social status position in society?



# Literature

- Ethnographic case studies and socio-political studies:
  - Institutions along power lines
  - Results in inequitable distribution, insecure water access for many
- NIE: assumption of homogeneous communities and 'common' rules of the game => depoliticized
- Recent NIE: impact of heterogeneity in society on efficiency and sustainability of collective action (Baland et al., 2007)
- Little attention for
  - Equity
  - Appropriation model
  - Internalised social embeddedness and its effect on adherence to norms and behaviour



# Literature *(cont.)*

- Influence social embeddedness on behaviour
  - Subjective utility (Okuno-Fujiwara, 2002)
  - e.g. effect different ability and status seeking on contribution to common good (Platteau and Seki, 2007)
  - differences in wealth: different behaviour in experiment (Cardenas, 2003)
- Social psychology: effect of power and status on behaviour
- Experimental economics:
  - e.g. ultimatum game: both low and high social status more generous to high social status of receiver (Ball and Eckel, 1998)



# Research instruments

- **Social status ranking**
  - Five irrigation schemes in rural Mufindi, Southern Highlands, Tanzania
  - Ranking by community of irrigation users (four groups per scheme)
- **Field experiment**
  - repeated distribution game: 13 groups with max 7 pairs of permanent upstream and downstream user
  - Upstream decides on water intake and earns accordingly
  - Downstream reacts on his water allocation and earnings: silent, communicates (dis)satisfaction or punishment via mediator
  - Five rounds with abundant water, ten rounds water scarcity
  - Water scarcity: productivity threshold can not be reached by both players



# Research hypotheses

- Appropriation behavior of upstream
  - Egalitarian norms, few adhere to selfishness axiom
  - Efficiency: minimum water to downstream to reach productivity threshold
  - In times of scarcity: fairness and efficiency are conflicting motives...





# Research hypotheses

- Effect of social status of upstream user
  - Higher social status more selfish
    - Less adherence to (egalitarian) norms
    - Exploits power, feels s/he deserves more
    - Less consideration for others' outcome
  - Higher social status more fair or altruist:
    - comfortable position and social esteem
  - Lower social status more fair or altruist:
    - More cautious about others' outcome because dependency
    - Feels others deserve and demand more



# Research hypotheses

- ‘Right enforcement’ behavior of downstream and effect of social status
  - High social status
    - Less use of mediator, enough ‘power’ to influence others him/herself
  - Low social status
    - More use of mediator because feeling of powerlessness
    - Reluctance of direct confrontation through communication



## Some results: distribution

- Selfishness axiom does not apply: strong egalitarian norms
- Even under scarcity: equal split preferred at high efficiency costs
- Upstream users with high social status more selfish, low social status more altruist



# Some results: strategy changes

- Under scarcity: 20% from fair to selfish
- Small percentage rotation
- Upstream users high and middle social status more sensitive to punishment and dissatisfaction and adapt hours of water used  
*(social esteem by being fair?)*
- Low social status upstream less prone to change distribution when punished or dissatisfaction  
*(on the verge of sustainable livelihood?)*



# Some results: reaction by downstream

- High social status downstream user: prefer to communicate dissatisfaction rather than calling mediator
- Low social status: more via mediator then express dissatisfaction
- Low social status downstream user: preference to remain silent, even when inequality in his/her advantage  
*(not to wake sleeping dogs?)*
- Under abundance: men more inclined to punish then communicate dissatisfaction



# Policy implications

- Equal sharing the norm even under scarcity
- Solid base for promoting more efficient rotation schemes
- Empowerment of low social status users to speak up against inequality

