

# Resource tenure reforms, preferences and enforcement mechanisms: Evidence on user cooperation in Namibia

Michael Kirk <sup>(1)</sup>, Sebastian Prediger <sup>(1)</sup>,  
Thomas Falk <sup>(1)</sup> and Bjørn Vollan<sup>(2)</sup>

<sup>(1)</sup> University of Marburg, Department of Economics, Institute for Cooperation in Developing Countries (ICDC).

<sup>(2)</sup> University of Mannheim, Department of Economics, Chair of Econometrics.





## Motivation:

So far, most economic studies on social capital focus on preferences that are conducive to economic development

But *unsocial* behavior is as ubiquitous as *social* behavior

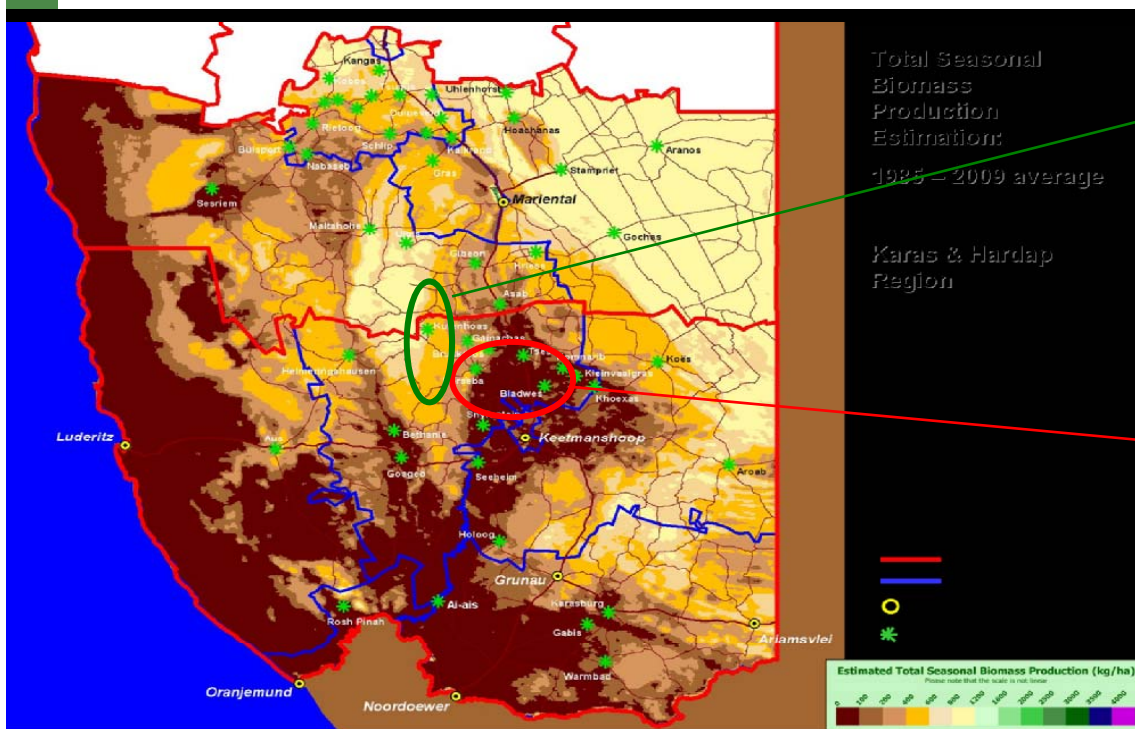
Recent experimental evidence: A substantial fraction of subjects harm others for the mere purpose of increasing own relative payoffs (Falk et al. 2005 *Econometrica*, Fehr et al. 2008 *AER*, Herrmann et al. 2008 *Science*)

**Research question: Does real-life resource scarcity shape preferences that are conducive or detrimental to development?**

**Methodology:** economic experiments, participants are paid according to their decisions (incentive compatibility)

## 2. Differences regarding resource scarcity

- Biomass production as indicator for resource availability/scarcity
- Average biomass production over the last 25 years, estimated via remote sensing (Espach et al. 2010, Agro-Ecological Zoning Programme, *Ministry of Agriculture, Water and Forestry*)
- **Two areas (60 participants from each)**, separated according to biomass production

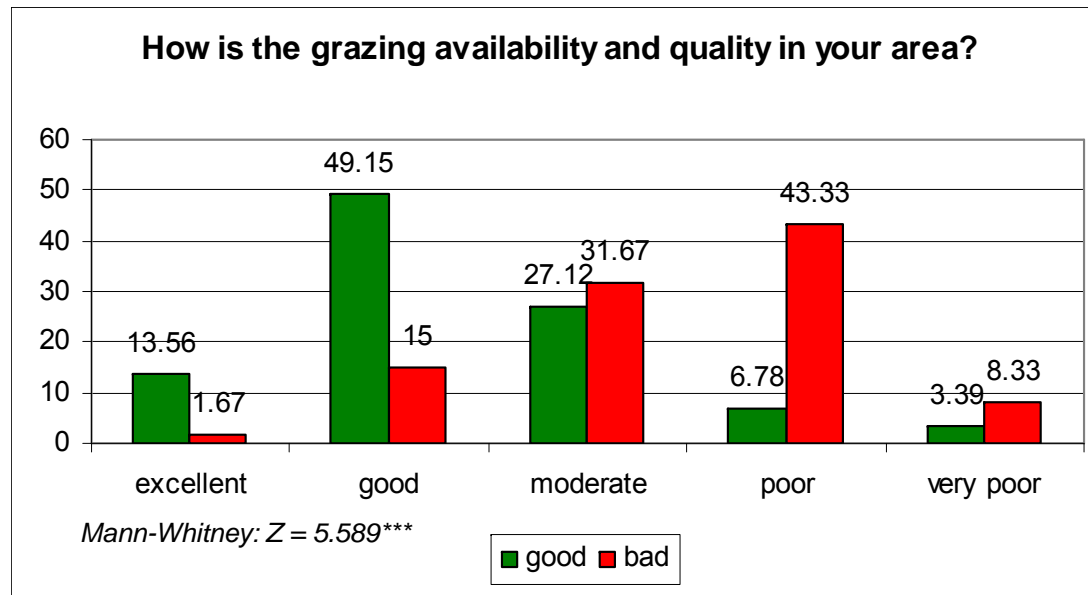


„**Good area**“: Biomass production > 400kg/ha (orange-yellow)

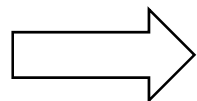
„**Bad area**“: Biomass production ≤ 100kg/ha (dark brown)

# Perceived resource scarcity

Results from the follow-up questionnaire:



Similar patterns for other questions regarding resource availability



Individual perceptions are congruent with biological facts!

### 3. Design of the *Joy-of-destruction* game

- Each participant gets N\$10 (one fourth of a daily salary)
- Two subjects are randomly & anonymously matched
- Each subject simultaneously decides whether to reduce („burn) the other’s money or not
- The game was played with 120 participants, 60 from each area (good, bad)

Player B	burn	not burn
Player A		
burn	<b>4 / 4</b>	<b>9 / 5</b>
not burn	<b>5 / 9</b>	<b>10 / 10</b>

*Nash equilibrium*

- The game is played one-shot (no reputation or other strategic motives)
- Outcomes were never revealed to the participants

# Results

- 38 subjects (31.67%) decided to reduce (burn) income



- Difference between areas is significant (Fisher's exact,  $p = 0.4$ )  
23% in GOOD area and 40% in BAD area

# Results

Expectations have strongest effect

Group variables (friends, family...) have expected signs

**Significant area difference!**

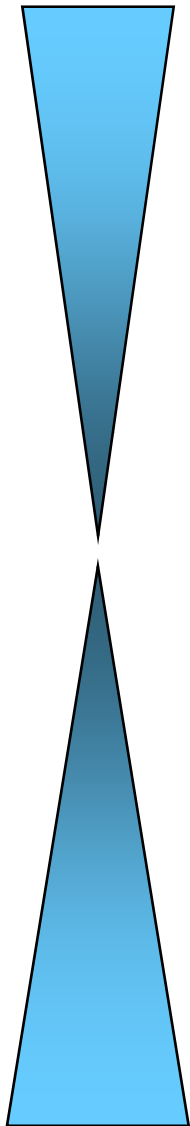
People from bad area behave more spitefully

Spiteful preferences constitute an obstacle to cooperation (and to trade) and thus to economic development

VARIABLES	Dep. Variable: burning decision (1 = yes)					
	(1)	(2)	(3)	(4)	(5)	(6)
	burn	burn	burn	burn	burn	burn
Area	-0.167** (0.083)		-0.263*** (0.095)	-0.257** (0.101)	-0.283*** (0.0986)	-0.297*** (0.106)
Expectation		0.660*** (0.080)	0.704*** (0.080)	0.718*** (0.082)	0.734*** (0.0810)	0.766*** (0.082)
Friends in session				-0.039 (0.025)		-0.046* (0.027)
Family members in session				-0.038 (0.036)		-0.034 (0.036)
Problems with participants				0.153 (0.316)		0.232 (0.360)
Male					0.021 (0.099)	0.0332 (0.106)
Education (grade)					-0.005 (0.018)	0.006 (0.019)
Farmer					-0.209* (0.121)	-0.241* (0.130)
Observations	120	120	120	120	120	120
chi2	3.885	45.36	52.86	57.22	56.18	61.15
ll	-72.98	-52.24	-48.49	-45.93	-46.83	-43.96
r2_p	0.026	0.303	0.353	0.384	0.375	0.410

*Marginal effects for burning decision after probit estimation*

## 4. Water reform and user cooperation



- **Past water policy:** related to dualistic land ownership and apartheid
- Commercial (white) farmers: water PR linked to private land ownership
- Weakening of traditional authorities
- restricted use rights in communal areas
- subsidization, “free good” character => overexploitation of water sources

### Rural Water Supply Reform:

- stronger stakeholder involvement
- more decentralized decision making
- Water Point User Associations
- joint operation of water installations
- management regulations
- cost recovery from users



# Enforcement mechanisms

- How to adapt implementation of water reform to capacities of communities to cater for themselves?
- Efficiency of moral & social (internal) enforcement mechanisms compared to material ones from third parties (local governments)?
- Karas region: insufficient monitoring and enforcement observed

<b>Types of enforcement mechanisms</b>	<b>Probability on enforcement becoming effective</b>
Material/ physiological enforcement ( <b>mp</b> ) [e.g. fines]	$p_{mp}$ low: limited capacities of lower jurisdiction/ admin in rural Nam
Social enforcement ( <b>s</b> ) [isolation, rejection]	$p_s$ relatively high: shared knowledge and punishment
Moral enforcement ( <b>m</b> ) [internal self-binding norms]	$p_m$ even higher: steering by morale, self-esteem

**Actors:**

- 1) local governments
- 2) water users

Both can work with material and social sanctions/incentives

⇒  $mp_g, mp_u$

⇒  $s_g, s_u$

cooperation in water management (f)

$$(p_{mpg} mp_g + p_{mpu} mp_u) + (p_{sg} s_g + p_{su} s_u) + (p_m m)$$

# Results from economic experiments

- bridging the gap between abstract concepts and real life observations
- 1. step: Measuring „moral status quo“ by *anonymous one shot trust experiment*
- Detecting reciprocity in order to sustain a norm



© T. Falk

- [Design: P1 sends any amount of his/her initial endowment to P2, => tripled by facilitator, P2 can send back any percentage of the received amount]
- P1 sent 41% of endowment to P2, 8% was sent back by P2, 30% of P2s sent back amount  $> 0$
- => low level of reciprocity compared to world wide results
- **m** exists, but moral dimension of fairness is low
- Without monitoring, players are dishonest

- 2. step: Testing impact of external enforcement: single trust game extended by social dimension  $s_u$  and external punishment option  $mp$
- Combining  $m$  with  $mp$  (threat of external punishment) => increase of return from P2 from 8 to 27 %
- Introducing  $s_u$  => game played between two friends: 52% sent back based on equity norm; playing between family members: 60 %
- Fear for anger and disapproval as relatively cheap motivator

3. step: Further assessing extent to which actor's decision to adhere to a rule is influenced by perceived probability of others externally enforcing non-compliance

=> The closer the social connectedness and social enforcement, the lower is expected external enforcement

© T. Falk



- Key role of community driven decision making in water reform
- Makes use of cheaply enforceable instruments (**s**, **m**)
- Other surveys show: WPA with strong social networks show better rule compliance (e.g. non payment of fees)
- To refer to external government enforcement (**mp<sub>g</sub>**) only in a subsidiary way as a last resort makes sense due to low **p<sub>mpg</sub>**



© T. Falk

**Table 3: Enforcement of Namaland water management**

	Enforce-ment instrument	Resource users			Government		
		Existence of rules	Probability of consequence being effective	consequence	Existence of rules	Probability of consequence being effective	consequence
<b>water management</b>	<b>Moral</b>	Internalised but formalised in user associations' constitution. E.g.: a) payment of monthly fee; b) no water for irrigation;	$p_{m_u}$ high because norms are internalised;	$m_u$ internal believe in their rightness;	no	$p_{mg} = 0$	$m_g$ no
	<b>Social</b>		$p_{s_u}$ high because based on internalised norms;	$s_u$ gossip, showing disapproval, social exclusion;	no	$p_{sg} = 0$	$s_g$ no
	<b>Material</b>		$p_{mp_u}$ Low;	$mp_u$ Fines, exclusion from water supply	Fundamental human rights and freedoms; Legal recognition of rules of user associations;	$p_{mp_g}$ Low, because of other priorities of judiciary and executive organs;	$mp_g$ fines;

## 5. Conclusions/Implications

- understanding of context, evolution, stability of preferences (risk, time) and social norms (trust, spite) of resource users related to cooperation
- positive correlation between spiteful behavior and resource scarcity
- willingness of participants to destroy other's income for the purpose of increasing the relative pay-off distance
- => government alert as further resource depletion, caused by unsustainable use and climate change, is likely to happen
- negative impact on community-based initiatives with equality (participation, benefit sharing) being a major target
- But also: existing moral and social norms as starting point for establishing more formal rules (resource management reforms)
- User investment in internal material enforcement to reinforce social norms
- plus expectation of external material enforcement where social enforcement is too weak (subsidiarity)
- Reform progress in context of coherent social networks
- Sensitizing government plus donors on support mechanisms of land reform beneficiaries in cooperation in marketing, credit access, etc.

# Thank you for your attention



Acknowledgements to:



The communities Richard

# Appendix 1: Studies on positive aspects of social capital

- Overwhelming experimental evidence that human beings have other-regarding preferences (i.e. consider others' welfare)
- Examples:
  - People propose positive amounts in Dictator games (altruism)
  - People cooperate in social dilemma games (conditional cooperation, reciprocity)
  - People punish free-riders at own costs even in one-shot games (altruistic punishment)
- So far, most studies have focussed on preferences that are conducive to economic development

## Appendix 2: evidence for unsocial behaviour

- **Antisocial punishment** (free-riders punish cooperators) in public good experiments, mainly driven by revenge or dominance (Falk et al. 2005 *Econometrica*, Fehr et al. 2008 *AER*, Herrmann et al. 2008 *Science*)
- People try to increase relative payoffs (Fehr et al. 2008 *AER*, Falk et al. 2005 *Econometrica*)
  - Differences between social groups: Willingness to reduce another's payoff stronger among people belonging to high castes than among those belonging to low castes in India (Fehr et al. 2008)
- Spiteful behaviour detrimental to economic development: lowers willingness to cooperate and to engage into trade

## Appendix 3: Implications of JOD

- In both areas, about 25% expected their mate to harm them
  - Among those, 69% burned their mate's money in the good area compared to 93% in the bad area
- Comparison of burning decisions of those who did not expect their mates to harm them:
  - 22% of subjects from the bad area nevertheless burned money
  - ... compared to less than 7% of the subjects who live in the good area



Further evidence for higher incidence of spiteful behaviour in bad area