# Community co-management and the perceived legitimacy of conservation

**Jetske Bouma and Erik Ansink, Institute for environmental studies, VU University Amsterdam, the Netherlands**

# Introduction

- PES sometimes to communities to strengthen NRM

- Ostrom (1990) convincingly showed that communities can sustainably manage common pool resources

- Recently, more attention for broader institutional context, resulting in concept of community co-management

- Community co-management depends not only on the communities' willingness to self-enforce, but also on the willingness to collaborate with the formal authorities

- This study will assess how perceptions of the formal authority's legitimacy influence self-restricted resource extraction, measured in a collective resource harvest game

IVM Institute for Environmental Studies

# Conceptual framework

- Legitimacy is 'a psychological property of an authority, institution or social arrangement that leads those connected to believe it is appropriate, proper and just' (Tyler, 2006)

- When people regard an authority as legitimate they 'feel they ought to defer to decisions and rules, following these voluntarily out of obligation rather than out of fear of punishment' (Tyler, 2006)

- For an authority to be perceived as legitimate, several factors play a role including elements like procedural justice, self-interest, shared values and norms (Suchman 1995)

- Few empirical studies assess how legitimacy affects voluntary cooperation and self-enforcement

# Conceptual framework

- Tyler (2006, 2007, 2009) conducted several empirical studies assessing the impact of legitimacy on rule compliance and voluntary cooperation

- Viteri and Chavez (2007): Perceptions of protected area legitimacy influence compliance with the reserve's conservation rules (Ecuador)

- Stern (2008): Perceptions of legitimacy influence voluntary rule compliance,  especially trust and consistency of rule enforcement play important role (USA)

- Baldassari and Grossman (2011): Perceptions of legitimacy influence producer cooperation (Uganda).

IVM Institute for Environmental Studies

# Empirical approach

- We adapted Stern (2008) legitimacy survey to collect data about respondent characteristics and legitimacy perceptions

- In addition, we conducted a field experiment to assess how legitimacy perceptions influence behavior in the game

- We tested the impact of legitimacy by framing a collective resource harvest game in terms of protected area management and surveying participants in the framed treatment ahead of the game

- Dufwenberg et al (2011): framing influences game behavior by giving participants a cue about comparable social situations (label framing)

# Experimental design

- Random sampling of participants

- Participants were anonymously grouped in teams of 4

- Pay-off function:

$$\pi_i = t_i + 0.4 \left( 80 - \sum_{j=1}^{4} t_j \right)$$

- Nash: participants extract all, earning 20 token.

- Social optimum: participants extract nothing and earn 32 token

- Game was repeated 5 times

# Experimental design

- Extraction decisions by putting token in coded envelops

- Participants were informed about a) the extractions of others, b) the remaining sum in the group account and c) their own earnings at the end of each round

- Extraction decisions limited to 0,5,10,15,20 token

- Experiment lasted approx one hour, but total session lasted 2.5 hours

- We conducted the experiment in two villages, Sierpe (near wetland) and Terraba (near forest).

- In both cases, the enforcement officer/formal authority is the ministry of environment (MINAE)
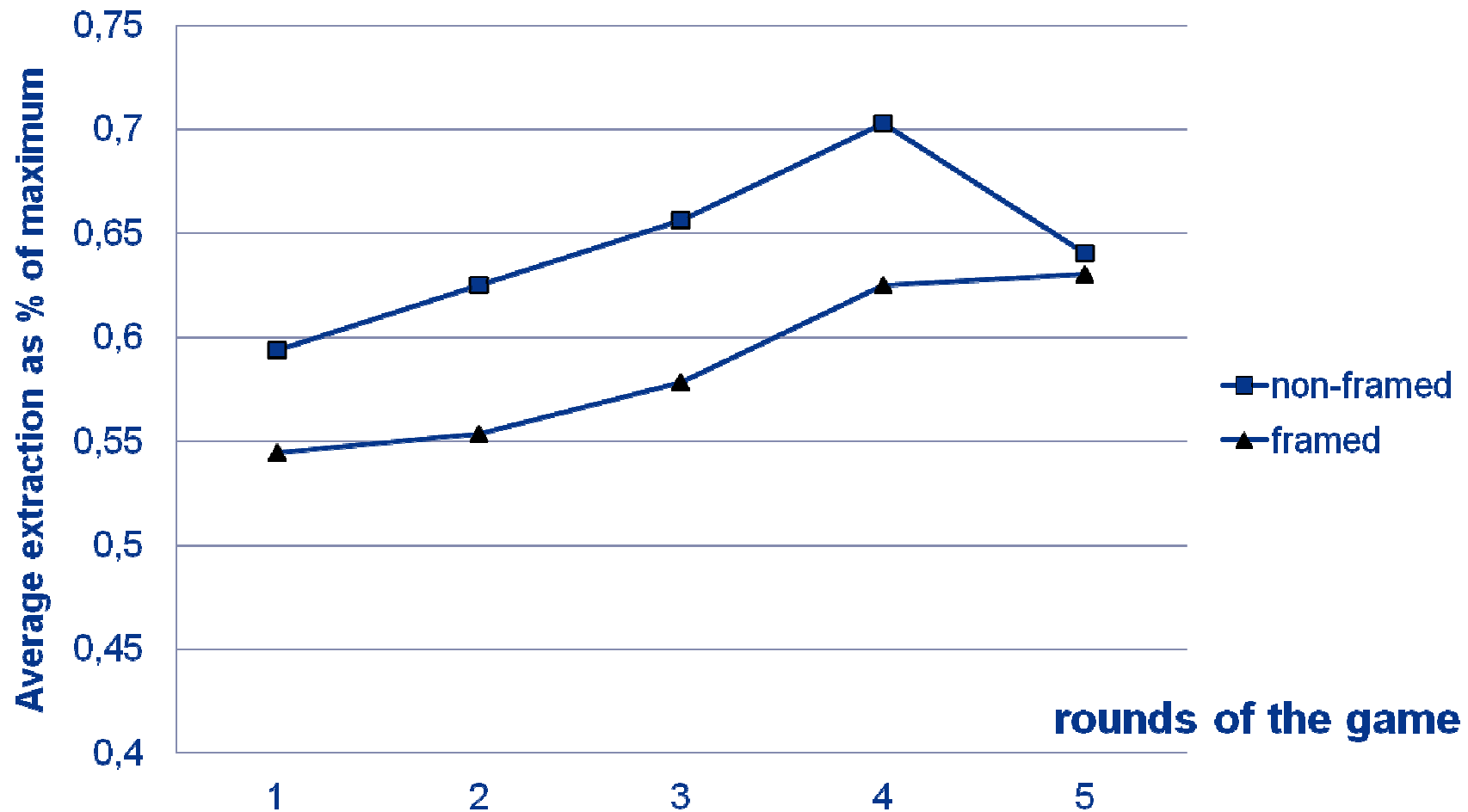
# Impressions- Sierpe

# Impressions- Terraba

# Results – main findings experiment

# Results- main findings survey

| | Sierpe | Terraba |
|---|---|---|
| % that believe rules are consistently enforced | 75% | 50% |
| % that believe enforcement officers treat everybody the same | 61% | 44% |
| % that (somewhat) trust enforcement officers | 68% | 50% |
| % that believes the community can influence park management | 68% | 75% |
| % that believe park officials (somewhat) understand local culture | 79% | 44% |
| % that believe most park officials are from outside | 32% | 44% |
| No. of observations | 28 | 16 |

# Results- summary statistics

|  | Sierpe | Terraba |
|---|---|---|
| Average age of participants | 37 | 39 |
| % female participants | 86% | 56% |
| % landholding households | 57% | 81% |
| % member of an association/community group | 47% | 69% |
| % income poor | 33% | 25% |
| % that collect natural products | 61% | 94% |
| % that know people from the enforcement agency | 46% | 38% |
| % that believes community members think the same about NRM | 46% | 44% |
| No. of observations | 28 | 16 |

# Results- probit analysis of legitimacy perceptions

| Variables included | Consistent rule application | | Equal treatment by park officials | | Influence in park management | | Park officials can be trusted | |
|---|---|---|---|---|---|---|---|---|
| | All | Sign. | All | Sign. | All | Sign. | All | Sign. |
| Gender | -0.17 | | -0.26 | | 0.33* | 0.35** | 0.35* | 0.36** |
| Landowning | 0.29* | 0.35** | -0.17 | | 0.03 | | -0.02 | |
| Village association | -0.29 | -0.36** | -0.15 | | 0.12 | | -0.26 | -0.41** |
| Income poor | -0.06 | | 0.03 | | -0.40** | -0.47** | 0.28 | |
| Collects natural resources | -0.33** | -0.29** | -0.09 | | -0.05 | | 0.06 | |
| Knows park official | -0.20 | | -0.34* | -0.40** | -0.27* | -0.25* | -0.15 | |
| Believes others think the same | 0.27* | 0.29** | 0.21 | | 0.008 | | 0.28* | 0.36** |
| Wald chi2 | 18.38 | 17.37 | 10.82 | 6.85 | 9.53 | 8.44 | 15.75 | 16.28 |
| Pseudo R2 | 0.27 | 0.24 | 0.18 | 0.12 | 0.19 | 0.18 | 0.29 | 0.24 |
| # Observations | 43 | 44 | 43 | 44 | 43 | 43 | 43 | 44 |

# Results- interval regression explaining round1 game

| | Consistent rule | Equal treatment | Influence in PA | Trust park official |
|---|---|---|---|---|
| Framing | -0.005 (3.10) | -1.09 (2.85) | 1.48 (3.46) | 2.92 (2.93) |
| Legitimacy indicator | 3.37 (3.23) | -3.46 (3.19) | 6.00 (3.14)* | -0.53 (2.99) |
| Interaction variable | -2.31 (4.19) | 0.86 (4.02) | -5.05 (4.25) | -6.24 (3.80)* |
| Constant | 12.05 (2.42)*** | 15.45 (2.11)*** | 10.57 (2.35)*** | 14.25 (2.25)*** |
| Wald chi2 (3) | 1.55 | 2.55 | 3.93 | 7.97 |
| Log-likelihood | -81.0 | -80.49 | -79.8 | -77.8 |
| # Observations | 44 | 44 | 44 | 44 |

# Results- interval regression explaining round 1 game

| | Model 1 | Model 2 |
|---|---|---|
| Age | | 0.15 (0.06) ** |
| Gender | | 3.50 (2.05)* |
| Framed treatment | 4.11 (3.53) | 0.97 (3.49) |
| Influence in PA | 6.49 (2.90)** | 5.22 (2.70)** |
| Trust in PA officials | -2.09 (2.90) | -3.44 (2.90) |
| Influence*framed | -4.24 (3.90) | -2.52 (3.62) |
| Trust*framed | -4.98 (3.66) | -3.52 (3.52) |
| Constant | 11.47 (2.45)*** | 5.71 (3.16)* |
| Wald chi2 | 13.39 | 21.19 |
| Log-likelihood | -75.1 | -71.16 |
| # Observations | 44 | 44 |

IVM Institute for
Environmental Studies

# Results- multilevel model explaining game all rounds

| | Model 1 | Model 2 |
|---|---|---|
| Age | | 0.14 (0.6)** |
| Gender | | 0.7 (1.8) |
| Framed treatment | 0.6 (3.0) | -0.7 (3.0) |
| Influence in PA | 2.5 (2.4) | 1.8 (2.3) |
| Trust in PA officials | 0.9 (2.4) | 0.9 (2.6) |
| Influence*framed | 0.77 (3.3) | 1.9 (3.1) |
| Trust*framed | -4.7 (3.1) | -4.8 (3.1) |
| Constant | 10.9 (2.1)*** | 5.8 (2.7)** |
| Wald chi2 | 7.38 | 15.46 |
| Log-likelihood | -715.6 | -712.7 |
| # Observations | 220 | 220 |

# Conclusion

- Framing lowers extractions, but not significantly, but when accounting for legitimacy perceptions framing does have a (weakly) significant effect.

- Specifically, perceived influence in park related decision-making lowers first round extractions and trust in park officials lowers extractions across rounds in framed game

- Overall, the analysis suggests that communities are more likely to self-enforce restricted resource use when they perceive park management as legitimate.

- Limitations: Small sample size and multi-facetted nature of legitimacy concept

IVM Institute for
Environmental Studies

# Acknowledgements

- We would like to thank and acknowledge the help and support of Alexander Lopez Ramirez, Ernesto Villalobos, Ana María Miranda Ovares, Yerlin Rosales Pérez and Nazareth Porras Quirós of the Universidad Nacional de Costa Rica (UNA) and Gerrie Gomez and Anastasia van de Bossche of the Institute for Environmental Studies, Vrije Universiteit Amsterdam.

IVM Institute for
Environmental Studies