Games for Triggering Collective Changes in Natural Resource Management: Four Cases from India

Thomas Falk, Wei Zhang, Ruth Meinzen-Dick, Lara Bartels

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Introduction

As resource users interact and impose externalities onto each other, institutions are needed to coordinate resource use, create trust, and provide incentives for sustainable management. Coordinated collective action can play a key role in enabling communities to manage natural resources more sustainably. But when such collective action is not present, what can be done to foster it?

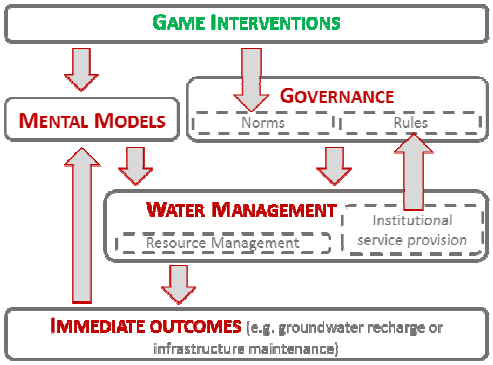
There is growing awareness that the governance of natural resources has to be adapted to the specific context. Interventions are often implemented at small scale and the potential to scale up the facilitation intensive approaches are limited; sustainable resource management too often does not emerge or breaks down after the project ends.

Project Objectives

This paper examines the potential to adapt behavioral games as a structured, replicable approaches to facilitate the emergence of sustainable natural resource management (NRM) at scale. Games have been adapted as learning and stakeholder engagement tools to improve management of the commons, strengthen self-regulation of resource use and enhance constructive interaction of resource users. We synthesize experiences from four applications of games as social learning interventions in India.

Conceptual background

A conceptual framework was used to structure the reflections on game interventions. The framework, as illustrated to the right, integrates inter-disciplinary behavioral science insights.



In summary, we assume that the games can influence mental models, support pro-social norms, in this way affect support local resource governance which leads to more sustainable management.

Methods

The authors have conducted a series of studies testing the use of behavioral games for institutional capacity development and social learning. All games are in its structure public good or common pool resource games framed to feature groundwater, surface water or forest management challenges in India. The detailed game designs can be found under gamesforsustainability.org. Table 1 provides more information on the studies. For more information, please see https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3771284

Results

Table 1 summarizes key findings of our studies. Observed impacts include changes in attitudes, debates about water conflicts, adoption of water management tools, and increases in collective infrastructure maintenance.

Table 1: Summary of game intervention studies

Game	States	Year	# site	Outcomes
Groundwater pilot	Andhra Pradesh	2013, 2014	17	Some effect on attitudes Communities more likely to adopt water registers & rules for groundwater *
Surface water	Rajasthan Madhya Pradesh	2016, 2017	30 60	Communities more likely brought swelling water conflicts to the table and engaged in dam maintenance activities *
Groundwater expansion	Rajasthan Madhya Pradesh, Andhra Pradesh	2014 - 2019	184	Total 3357 farmers adopted less water consumptive crops or varieties and irrigation scheduling to save water**
Forest game	Andhra Pradesh Rajasthan	2017, 2018	60	Positive attitude towards game experience but limited changes in views or behavior

*Compared to randomly selected control communities where game has no been played
**Compared to farmers' reported behavior, prior to the games

Reflecting on the design of the games, we identified the following aspects as critical game design features:

1. Accuracy, complexity, and flexibility of the game framing.
2. Multi-player environment, communication, and group competition.
3. Participatory learning environments.
4. Incentivized payments.

Conclusion

The games provide a structured and therefore replicable approach for influencing behavior. They can improve system understanding, raise awareness, influence norms, facilitate dialogue, train for crisis response, and increase legitimacy of decisions. Acknowledging the diversity of intervention tools developed, there is a critical need to guide practitioners in selecting the right tools for the right purpose.

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