

# Mechanisms for Fostering Multi-stakeholder Dialogues in Water Resource Management Projects



**W**ater resource management takes place in complex, rapidly changing and uncertain realities. Users may not be aware of the impact that water decisions have on other users, and even where externalities are identified, they can be difficult to manage due to problems of information, communication. The increasing number of stakeholders all competing

for access to limited water resources reduces the chances for achieving consensus on use. These difficulties are further aggravated when poverty incidence is factored in.

Poor coordination among stakeholders perpetuates inefficient water use, economic and environmental damage, negative externalities and social conflicts.

With the decentralization of local renewable resource management, there is a demand for innovative approaches, methods and tools that can improve the system's adaptive capacity. After all, investments in social capital and collective action can have a major impact on helping people, especially the poor, break out of poverty traps. This document presents various mechanisms that can be employed to foster multi-stakeholder dialogues based on the experiences of and lessons identified from various water resource management projects under the CGIAR Challenge Program on Water and Food (CPWF).

problems requires a high degree of coordination and cooperation. To develop solutions to overcome barriers and foster equitable and sustainable watershed resource management, there is a need to explicitly express the relationships between collective action, scale and poverty. Some mechanisms designed to achieve this are discussed below.

## Conversatorio de Accion Ciudadana



The Conversatorio de Accion Ciudadana (CAC) is a politico-legal mechanism, that was implemented in three Colombian watersheds between 2005 and 2007. It is designed to address the inequalities in power and information between communities and government institutions, that often prohibit the former from exercising constitutional rights to participate and to hold the latter accountable. It is based on the idea of civil society and authorities conversing in familiar terms about issues of importance to both and arriving at agreements for action. In the end, it is expected that meaningful participation by civil society is achieved. The

legal skills that private individuals learn can enable them to obtain information they had previously been denied and to compel authorities to respond within a fixed amount of time to specific concerns they had previously ignored.

CAC led to 76 concrete commitments on the part of institutions to improve the watershed residents' welfare and resource management. An assessment in late 2007 showed that compliance rates were relatively high, especially in communities which had stronger follow-up processes.

## Strengthening the engagement of the poor in community Processes<sup>1</sup>

There is a complex relationship between poverty and water. Achieving and maintaining collective action in watersheds to adequately address

<sup>1</sup> Source: [http://www.capri.cgiar.org/pdf/Resources\\_Rights\\_Cooperation\\_H-10.pdf](http://www.capri.cgiar.org/pdf/Resources_Rights_Cooperation_H-10.pdf)

### CAC: Lessons learned

- ◆ The CAC methodology can have significant human and social capital impacts on community members who participate. It can also lead to changes in the ways that communities and institutions perceive each other, in some cases, moving from antagonism to respectful collaboration.
- ◆ CAC takes time. The SCALES<sup>1</sup> project was thought to take 3-6 months, but it took a year and a half to complete. More time should be allocated to properly prepare the communities and make institutional contacts.
- ◆ A committed local institution with experience in community organization is the most critical determinant of success for CAC.
- ◆ The early involvement of partner institutions can lead to more meaningful participation during the negotiation phase.
- ◆ CAC impacts will be larger and will likely be more widely distributed if more community members are involved. A core team will always lead the process; however, more emphasis can be put on having them share progress and seek feedback from their communities.
- ◆ Increasing the general public's involvement with the CAC itself will make it clear to institutions that the people asking questions have the support of their communities.

## Economic experiments

Economic experiments, sometimes referred to as economic games, simulate real-world situations by

providing participants (players) with the same kinds of incentives that they would face in real-world decision-making situations. The experimental context allows researchers to vary the incentives—i.e., the rules of the game—and see the impacts of individual decisions' outcomes as well as collective outcomes. Participants observe both types of outcomes, and how changes in rules can affect these. The impact that this can have on individuals and on the group as a whole, especially when community-level feedback sessions are held, can serve as powerful tools enabling people to understand collective action dilemmas and can thus be a starting point for change (Cardenas and Ostrom 2004).

### Economic experiments

The economic experiments were conducted in Coello River and Fuquene Lake watersheds in Colombia, and Awach and Kapchorean rivers in Kenya. Three hundred and fifty-five and 284 participants joined the Irrigation Game and Water Trust Game, respectively. The sample (participants) distribution was gathered from across basins, games and treatments. In Colombia, the economic games were conducted as part of the CACs. In Nyando, they were run independently due to problems with the implementation of the action research agenda in Kenya.

Collective action around water involves both the provision and the appropriation of the resource. Cooperation provision can be affected by the rival nature of appropriation and the asymmetries in access to the resource. To look at collective action around provision and appropriation, three experiments were used: the Voluntary Contribution Game (VCM), the Irrigation Game, and the Trust Game. In all games, the participants received monetary incentives based on tokens earned during the game.

<sup>1</sup> SCALES (Sustaining inclusive Collection Action that Links Economic Scales in upper watershed) is a project (PN 20) under the CPWF



## A. Voluntary Contribution Mechanism

The Voluntary Contribution Mechanism draws from reciprocity and conditional cooperation theory introduced by Sugden and applied by Fehr and Gächter. They learned that positive reciprocity compels participants to contribute something to the public good if others are willing to contribute also. To sustain contribution to the public good, participants need to be reciprocally motivated. On the other hand, negative reciprocity can play a crucial role if participants think that others have a “free ride.”

### Voluntary Contribution Game

1. At the beginning of each round, each player is given 25 tokens, which they could contribute to the public good or keep in a private account.
2. Participants are grouped into five people per group. The total contributions to the public fund by the five players is doubled and

distributed in equal shares to all players of the group at the end of each round.

## B. Irrigation Game

The Irrigation Game is a new economic experiment that demonstrates the provision and appropriation aspects of the resource. It highlights the unequal access to and provision of water resource among players.

1. In the first part of the game, the players are given 10 tokens. They will have to decide how many tokens they would want to contribute to a project to maintain water canals. The amount of available water for the group is increasing as the group contribution increases.
2. Non-contributed tokens are kept in a private account, which yields private returns. These tokens are paid at the same monetary rate as the water units to be extracted in the second stage of each round.

3. The second decision of the players involves individual water extraction from the total water produced. This decision is made based on the location of the players along the water canal. Players positions are determined randomly for the entire sequence of rounds. Their position is represented by a letter: A for the player in the first position and E for the player in the last position. The water is allocated, therefore, according to the location in the following manner. Player A first receives all the water produced by the group project and decides how much water to extract. The remaining water is then shown to Player B at who then decides how much to extract and how much to leave to the remaining players downstream, and so on for players C, D, and E. This sequence is conducted for 10 rounds.
4. After the first 10 rounds of baseline treatment, the rules change for some groups and this change was announced to the players. Some groups are permitted to communicate, other groups faced external regulation treatments, and others continue to play under baseline conditions.
5. In the face-to-face communication treatment, players are allowed to communicate with the other players in the group before returning to their places to make their own private decisions. As in the baseline, they know the aggregate decision but not the individual decisions after each decision round.
6. In the external regulation, or penalty treatments, players are told that there would be a chance of being monitored each round. The experimenter rolls a dice in front of the participants each round, and if it landed on all the participants would be inspected. The monitor checks the decisions of the players and the players who have taken more water than their fair share (1/5, given that there are five players) are fined. In the high– penalty treatment, the fine is the water taken in excess of the of the fairshare plus six units from the earnings; in the low–penalty treatment, the fine is just the extra amount taken.

### C. Water Trust Game

The Water Trust Game is based on the standard trust game (Berg *et al.* 1995), but, in this sense, it is framed around water access and distribution between two persons located in different positions of a watershed.

1. At the beginning of the game, both players are given eight tokens.
2. Player 1 (proposer) can send a fraction of his/her initial endowment to Player 2 (responder). The amount sent by Player 1 is tripled before it reaches Player 2, who then decides how to split the tripled amount plus his/her initial endowment between himself/herself and Player 1. This increase in the amount being sent reflects how a decision in favor of watershed conservation would increase the possibilities of greater social benefits to be distributed among the watershed members.
3. In the framing, however, the decision of Player 1 was explicitly framed: if upstream, as the quantity of clean water sent to Player 2 downstream, and Player 2's decision as an economic compensation for the water provided by Player 1. If the game starts with a downstream player, such a decision is also framed as economic compensation for the water provided by Player 1.
4. The Trust Game is implemented using the strategy method, that is, Player 2 is asked

the complete strategy of responses to each possible offer by Player 1. Therefore, Player 2 has to respond, without knowing yet the amount offered by Player 1, how many tokens he/she would return to Player 1 for each possible offer by Player 1 (0, 2, 4, 6, 8 units).

5. During the session, each of the players is asked the amount expected from the other player.

## Conclusion

The use of economic games or experiments for the study of issues of development and the environment has increased substantially over the last few decades. Behavioral sciences have made large contributions to the understanding of collective action and how rules and norms play a crucial role in solving the problem of managing common-pool resources and solving the dilemma of group-based property rights.

In addition to helping to understand the foundations of behavior, these games can create space for an interactive dialogue with communities facing these dilemmas. The games offer some potential for self-reflection in a dialogue among stakeholders, and even for social learning processes that create actual changes in behavior beyond the domain of the controlled game.



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## Partner Organizations

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Fundación Humedales, Colombia  
International Food Policy Research Institute  
Maseno University, Kenya  
SANA  
Semillas de Agua, Chile  
Universidad de los Andes, Colombia  
World Agroforestry Center  
World Wildlife Fund, Colombia

Companion Modeling  
Can Tho University, Vietnam  
Chiang Mai University, Thailand  
Chulalongkorn University, Thailand  
CIRAD – Agricultural Research for Development, France  
International Water Management Institute  
Ministry of Agriculture and Forests, Bhutan  
Ubon Ratchathani University, Thailand

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*Tags: PN20: Sustaining Inclusive Collective Action*

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