

# Scaling up experiential learning for water management

Ruth Meinzen-Dick<sup>1</sup>, Thomas Falk<sup>1</sup>, Richu Sanil<sup>2</sup>, Hagar EIDidi<sup>1</sup>, Wei Zhang<sup>1</sup>, Katrina Kosec<sup>1</sup>, Mequanint B. Melesse<sup>3</sup>, Vishwambhar Duche<sup>4</sup>

<sup>1</sup> International Food Policy Research Institute (IFPRI), Washington, DC, USA

<sup>2</sup> Foundation for Ecological Security (FES), Gujarat, India

<sup>3</sup> International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Nairobi, Kenya

<sup>4</sup> International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India

## 1. Introduction

Unsustainable water management is associated with reduced agricultural production and poverty, reduced ecosystem services and resilience, and insufficient and unreliable domestic water access. As a common pool resource with high subtractability and low excludability, water is easily depleted if no effective coordination exists among users to ensure provision and regulate withdrawals. This creates one of the greatest challenges for people living in semi-arid and arid environments. The majority of India's population is estimated to face physical water scarcity for at least part of the year, with 600 million people living in areas of [high to extreme water stress](#). As water management is highly complex, with many users sharing the same resource but often unknown to each other, [stopping overuse is difficult](#), especially when it is more profitable to irrigate water-consumptive crops than water-conserving crops.

Farmers, policymakers, donors, and nongovernmental organizations (NGOs) in India have all articulated the [need for more effective tools to improve water management and governance](#). Coordination and effective management of water resources are crucial to sustain agricultural productivity, but so far progress has been disappointing. Technical tools such as [crop water budgeting](#) can play an important role in enabling communities to manage their water resources, but unless communities have the [knowledge and motivation](#) to use these tools, their application and impacts are limited. To date, attention to the question of how knowledge about collectively available water is translated into effective management through collective action, norms and rules has been insufficient. Blueprint rules introduced in a top-down manner have [not changed water users' behavior](#). However, there is strong evidence that [effective community rules and their enforcement](#) can motivate such behavior. The better these rules fit the [social-ecological context](#) and internalized norms, [the more effective they will be](#). [Participatory development approaches](#) have addressed these challenges. The key question is how to promote such coordination, rules, and behavior in a participatory way without external imposition and in a low-cost manner that allows large-scale implementation.

## 2. Games for experiential learning

[Collective action games](#) offer a promising approach to encourage communities to work together on water management. Such games simulate the effect of individual behavior on resource outcomes that affect the whole community. Structured community “debriefings” and reflections after the games help game participants and other community members to discuss how lessons from the games apply to their real-life situations.

Since 2013, the Foundation for Ecological Security (FES), International Food Policy Research Institute (IFPRI), and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have worked together to develop and test the effectiveness of games for experiential learning about [surface](#) and [groundwater](#) management (Table 1). Previous evidence has demonstrated that these face-to-face games can facilitate social learning, innovation, and dialogue; support stakeholder engagement in collective decision-making; help communities improve management of [surface](#) and [groundwater resources](#); and strengthen communities’ adaptive management capacity. Piloting of the groundwater game in 17 communities and the surface water game in first 30 communities, then 60, showed a significant increase in adoption of community rules for water management. Based on this experience, FES expanded the approach to 184 communities.

**Table 1** Piloting and initial expansion of groundwater and surface water games

Game	States	Year	# Sites	Outcomes
Groundwater pilot	Andhra Pradesh	2013, 2014	17	<a href="#">Some effect on attitudes</a> <a href="#">Communities more likely to adopt water registers and rules for groundwater</a> *
Surface water	Rajasthan, Madhya Pradesh	2016, 2017	30, 60	<a href="#">Communities more likely brought growing water conflicts to the table and engaged in dam maintenance activities</a> *
Ground-water expansion	Rajasthan, Madhya Pradesh, Andhra Pradesh	2014–2019	184	Total 3,357 farmers adopted less water-consumptive crops or varieties and irrigation scheduling to save water**
*Compared to randomly selected control communities where game has not been played **Compared to farmers’ reported behavior, prior to the games				

## 3. Scaling up experiential learning

Based on these findings, under the project [Scaling up experiential learning tools for sustainable water governance in India](#), we aimed to implement this experiential learning approach in 1,500 communities in India directly through FES and 2,000 communities through other organizations’ programs from 2020 to 2023.

Achieving such ambitious targets required thinking differently about how to implement this approach. [As noted by Woltering and colleagues](#), scaling beyond a controlled project context requires thinking beyond counting the numbers who adopt an innovation to sustainable systems change at scale that will last beyond the project timeframe. In the remainder of this brief, we describe the processes employed to scale up these interventions and reflect on areas of success and needs for further improvement.

### **3.1. Changes to field implementation**

While in the pilots and initial expansion the games and debriefings were led by FES staff with experience facilitating participatory processes, scaling up would require training a much larger cadre of implementers. FES had positive experience working through community resource persons (CRPs), who are nominated and paid by the community organization responsible for the management of resources based on terms of reference between the CRP and the community organization.

We therefore adapted the games and debriefing so that they could be implemented by CRPs. This involved developing a script and android apps for each game that CRPs could use to implement each stage of the games, along with step-by-step instructions for the [debriefing sessions](#). Through multiple iterations of revisions and feedback from CRPs, the games and debriefing instructions were simplified and streamlined. These changes contributed to a reduction in implementation costs. According to our estimates, conducting one experiential learning session at one site costs between US\$70 and \$120, depending on accessibility. This includes the time of facilitators, transport, materials, and initial training.

In the pilot phase, we learned the importance of involving women in the games. The groundwater game was played separately by a group of 5 men and a group of 5 women in each community to allow women to talk freely, while the surface water game had a variable number of women among the 7 players in a single game in each community with the aim of stimulating discussions among men and women. However, it was especially challenging for women to set aside enough time for the whole activity, given their domestic responsibilities. Thus we adapted the game so that if one player had to leave, someone else of the same gender could take their place. The time chosen for the activities is important. Given gender norms, women are responsible for cooking in their households, and if the activities are scheduled close to when they have to cook, they will try to hurry through the game, thus depleting water table to end the game early. To avoid this, we developed instructions for scheduling the games that prioritize women's availability. If available time is limited, the facilitator modifies the game by cutting short the rounds once he/she get a sense that the participants understand the message. Similarly, during the debriefing session, the facilitators address issues pertaining to women, such as repair of handpumps and sanitation, so that women easily relate and participate effectively.

To explain the rationale for the approach and collect experiences in applying the project's tools, we developed a [sourcebook](#). This resource provides a framework for the overall approach to engaging with communities and a broad set of principles, processes, and action steps that practitioners working in different contexts can build on to improve management of water as a shared resource. It includes lists of tools for engaging with communities on strengthening water governance as well as illustrations, case studies, and reading materials for further information. The sourcebook can also be shared with other organizations interested in using our tools. Laying out the underlying motivation for the tools is intended to help future users go beyond rote application of the tools to thinking how they can be adapted for their own context. Because the sourcebook provides a quick, easy-to-understand snapshot of water governance, sharing it was an effective tool for engaging with NGOs and government organizations working on similar problems.

### **3.2. Building capacity to implement**

FES developed a training program for the CRPs facilitating the experiential learning package. Training was complicated because the project began in 2020 during the COVID-19 lockdowns. Without the CRPs, it would have been impossible to begin work in 2020, because outsiders were not allowed into many villages. However, restrictions on CRPs' travel made it difficult for them to attend in-person training; yet, it was hard for them to learn how to lead the games without experiencing them in person. To address

this, FES developed a hybrid training program, with the conceptual background presented in online sessions and a focused short in-person session to experience the game. This training used the Prakriti Kar-yashalas, FES training centers in each district, that are skilled in building the capacity of CRPs and other local leaders.

### 3.3. *Partnerships for scaling*

Although FES has a presence in thousands of communities across 14 states, achieving [systemic change in water management](#) requires going beyond what one civil society organization can do. Under its Promise of Commons initiative, FES has expanded its focus beyond direct provision of support for communities for managing their shared natural resources (including water) to building a coalition of actors who can assist communities in developing their own rules and approaches for water governance. Thus, building partnerships with government agencies, other civil society organizations, and even private sector organizations was an integral part of our plans from the beginning.

Partnership building started with organizations already working with FES on commons governance. Initial calls were held with interested organizations to explain the use and potential of the tools. Upon request, FES then organized a three-day water governance training: the first day focused on deepening understanding of water as commons, followed by two days focused on the tools, including a field component where participants could experiment with applying the tools.

One of the first organizations to adopt the experiential learning tools to address water management was the Odisha Livelihoods Mission, a state-level program to ensure sustainable livelihoods for rural communities. The Odisha Livelihoods Mission trained their *krishi mitras* (frontline workers supporting approximately 10 villages each) in the use of the tools. As one *krishi mitra* explained:

With water games and crop water budgeting, I am able to make the community understand that water is a common resource, and part of my job is to make the community conscious of their water usage, and to highlight the importance of each of their choices towards collective well-being. ... Using tools like water games and crop water budgeting helps in initiating the discussion around water and fosters the idea of water as Commons.

(Sankajhini Pradhan, October 18, 2023)

The satisfaction expressed by these field officers helped to build support for this approach at higher levels of the organization as well.

In Andhra Pradesh, the Drought Mitigation Project was another early adopter of experiential learning, and in Maharashtra, the Amaravati and Yavatmal District administrations also used the approach, as did Cotton Connect, a private sector program working with cotton farmers in eight districts of the state. We used a cascade model training program: trained FES staff gave training to master trainers of their respective NGOs and government partners. Those selected as master trainers are skilled individuals who facilitate training of the field-level implementers of the NGOs and government partners. ICRISAT also provided training on the experiential learning tools to government staff participating in the implementation of the Odisha PVTG (Particularly Vulnerable Tribal Groups) Employment and Livelihoods Improvement Programme (OPELIP). In 2023, FES gave training on these tools to the Sanjeevani Institute for Empowerment and Development (SIED), PRADAN, VIKSAT, Indo-Global Social Service Society (IGSSS), Reliance Foundation, and Swades Foundation. Through these efforts, 680 NGO personnel were trained.

The partner with the greatest potential for scaling up this approach is [Atal Bhujal Yojana](#), a Government of India program designed to demonstrate community-led sustainable groundwater management that can be taken to scale in water-stressed areas of seven selected states. FES signed a memorandum of understanding with Atal Bhujal Yojana, under which FES provides support for capacity building of program functionaries on participatory groundwater management, orientation to state resource agencies, and training of master trainers for Atal Bhujal Yojana District program management units and its implementation partners (often other NGOs). This training and support includes water management games for demand-side management, as well as use of the [Composite Landscape Assessment and Restoration Tool \(CLART\)](#) for soil and water conservation planning as supply-side management. FES trained 500 Atal Bhujal Yojana staff in 2024.

### **3.4. Boundaries of scaling**

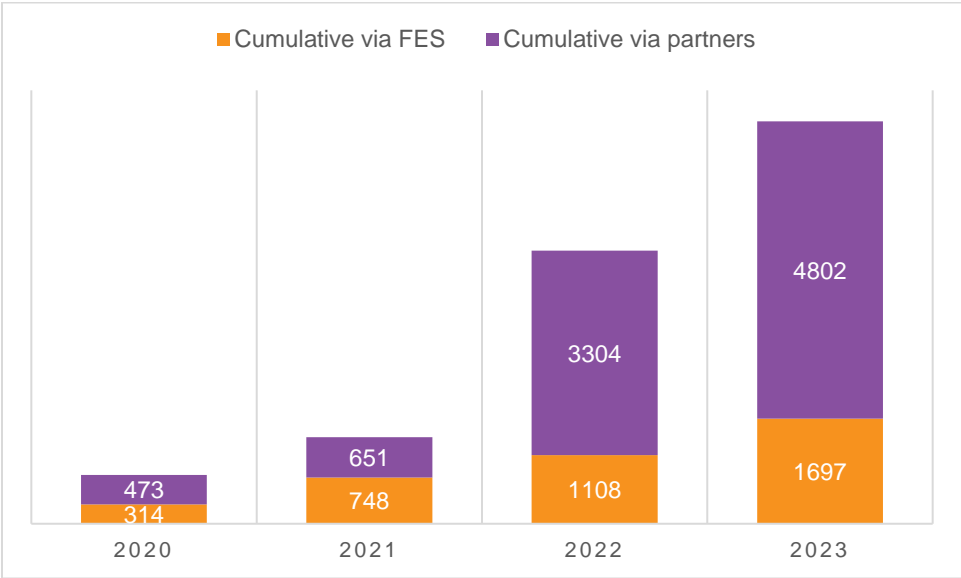
While it might be possible to play the games in almost any community, they are designed to address particular problems and social dilemmas, especially those where community collective action could create benefits at the community level. For example, in confined hard rock aquifers, restricting groundwater use can generate local benefits, but in large-scale alluvial aquifers such benefits may not be manifested locally. Thus, it is important to identify suitable domains and boundaries for scaling up this approach. Matching the local situation with the right game intervention requires that field facilitators engage with and understand the local context.

For direct uptake of the game through FES, we drew on a combination of FES's deep knowledge and scientific assessments of both the hydrology and the socioeconomic contexts in their areas of operation to delineate the boundary of the scaling. However, FES CRPs and other organizations had questions about selecting which tools to use. To assist in this process, we developed a [Decision Tree for Water Commons Games](#) to quickly identify which games best fit the situation in a particular community, drawing on local expert knowledge. Process facilitators ask local key informants a series of questions, incorporated into a smartphone app, to characterize the local water management context and possible social learning interventions. The decision tree starts by asking if water scarcity is an issue. If there is no awareness of water management issues, open probing questions are asked to confirm that they do not exist. If water scarcity is a concern, it then asks whether the community primarily uses surface water from a canal irrigation system or groundwater. If communities mostly use groundwater, the decision tree leads to questions about wells running dry and intensive groundwater use for irrigation. This is followed by questions about any alternative management practices—such as more water-efficient crop choices—that could improve group outcomes. The final question checks if there are any local rules to coordinate crop choices and allocate water. Facilitators ask similar sequences of questions about canal irrigation management, collective maintenance of water harvesting structures, and allocation of surface water from small ponds or “tanks.” The process ends with recommendation of approaches that would fit best with community challenges. The intent of this tool is to prevent scaling beyond the recommended domain of each tool, which could frustrate implementers and communities and thus be counterproductive.

## **4. Reflections on scaling**

The adaptations of our approach from the pilots with the surface and groundwater games have shown enormous success, far exceeding the project's original targets of assisting 1,500 communities directly and 2,000 communities indirectly, as shown in Figure 1. But the adaptations also changed the program qualitatively, creating new challenges and opportunities.

**Figure 1** Direct and indirect uptake of experiential learning tools, by year



Changing the lead facilitators from highly trained NGO staff to CRPs reduced control over the implementation processes. In particular, follow-up interviews showed that CRPs had [varied understandings of the debriefing process](#), and did not always follow the protocols, particularly in encouraging broad participation and especially women’s participation. But there were also advantages in having local people lead the process, because they know the local conditions and people. This was essential in the first two years of the scaling project, when outsiders could not enter many villages because of the COVID-19 pandemic. Further research to observe how CPRs facilitate the games and debriefing could help to strengthen the training process for future facilitators.

We also note the boundaries and limits to scaling. In addition to verifying that local social-ecological conditions match a game’s design (for example, through the [decision tree](#)), it is important to look at the [larger systems](#) of support that are available. The games and debriefing are an entry point for experiential learning, but other tools such as crop water budgeting are needed to achieve full benefits for the communities.

Expanding the lead implementing organizations from FES to the government, private sector, and other NGOs similarly creates risks and opportunities because of their different organizational mandates and orientations and their orientations on how to work with communities. For example, FES puts a strong emphasis on understanding water as a commons and helping communities to manage their natural resources, whereas Odisha Livelihoods Mission’s emphasis is on livelihoods. Although there is a strong overlap in their emphasis, the Odisha Livelihoods Mission link the games and other tools in their program with Agriculture Department interventions to increase awareness of water-efficient agriculture practices. Atal Bhujal Yojana works with a network of NGOs with expertise in community participation and water management. While the games and debriefing may provide these partners with new tools, they will be used in conjunction with other tools and approaches they use, which may lead to different outcomes. Documenting how the games, debriefing, and follow-ups are modified by the various implementing organizations, and what outcomes these have, would be valuable for refining and adapting the experiential learning approach to water governance.

---

## ABOUT THE AUTHORS

**Ruth Meinzen-Dick** and **Wei Zhang** are Senior Research Fellows, **Thomas Falk** is a Research Fellow, and **Hagar ElDidi** is a Senior Research Analyst, all with IFPRI's Natural Resources and Resilience (NRR) Unit. **Richu Sanil** is a Senior Project Manager at the Foundation for Ecological Security (FES). **Katrina Kosec** is a Senior Research Fellow with IFPRI's Poverty, Gender, and Inclusion (PGI) Unit. **Mequanint B. Melesse** is a Senior Scientist and Cluster Head of Technology Adoption and Impact Analysis in the Enabling Systems Transformation research program and **Vishwambhar Duche** is a Senior Scientific Officer, both with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

---

Funding for this work was provided by German Federal Ministry for Economic Cooperation and Development, commissioned and administered through the Deutsche Gesellschaft für Internationale Zusammenarbeit, grant number: 81250397. Additional funding has been provided by the CGIAR Initiative on NEXUS Gains. This publication has been prepared as an output of the Scaling up experiential learning tools for sustainable water governance in India project and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI.

## INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

*A world free of hunger and malnutrition*

IFPRI is a CGIAR Research Center

1201 Eye Street, NW, Washington, DC 20005 USA | T. +1-202-862-5600 | F. +1-202-862-5606 | Email: [ifpri@cgiar.org](mailto:ifpri@cgiar.org) | [www.ifpri.org](http://www.ifpri.org) | [www.ifpri.info](http://www.ifpri.info)

© 2024 International Food Policy Research Institute (IFPRI). This publication is licensed for use under a Creative Commons Attribution 4.0 International License (CC BY 4.0). To view this license, visit <https://creativecommons.org/licenses/by/4.0>.