FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

REPORT ON

Strengthening Water GOVERNANCE and Collective Action Through Groundwater Games

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FEED THE FUTURE INNOVATION LAB FOR SMALL SCALE IRRIGATION

Groundwater resources are challenging to govern

As a result of growing food demands, more affordable drilling and pumping technologies, and climate change, groundwater resources are rapidly depleting in many places around the world.

In sub-Saharan Africa, small-scale irrigation is becoming increasingly popular, and pressure on groundwater resources is growing. However, most of the existing water institutions fail to integrate governance of groundwater sources.

With limited state capacity to regulate groundwater extraction, community institutions and collective action are important for sustainably managing groundwater resources.

Photo: Reel Diaries.

12%

POST-GAME INCREASE IN PARTICIPANTS WHO AGREE THAT COMMUNITY MEMBERS SHOULD ACT COLLECTIVELY TO MANAGE GROUNDWATER

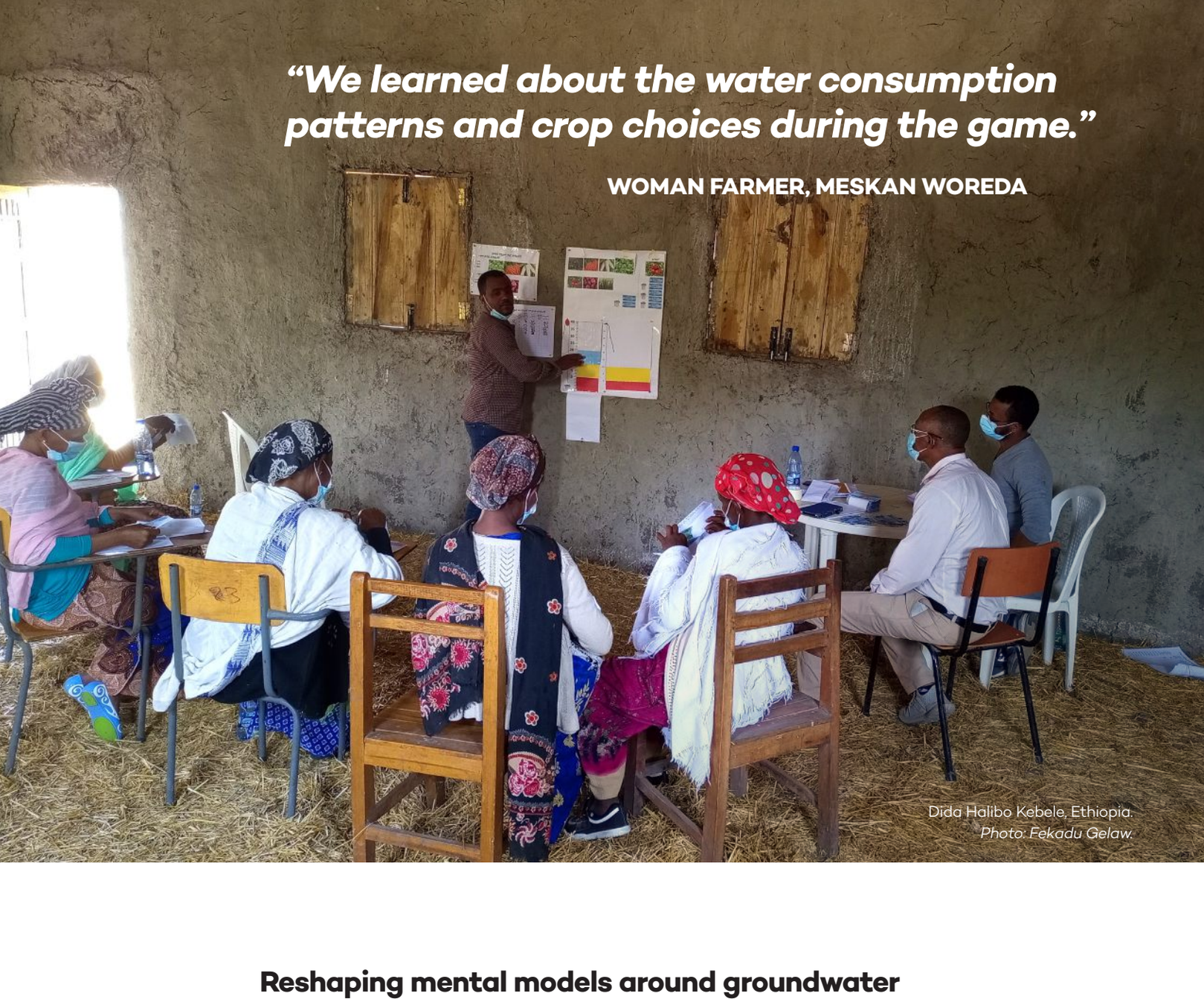
Groundwater games for experiential learning

The Innovation Lab for Small Scale Irrigation piloted an experiential learning intervention in Ethiopia and Ghana using a groundwater game first developed for India to help raise awareness of groundwater over-extraction and improve understanding of the importance of collective action in governance.

The study assessed the potential of the game as an experiential learning tool to improve understanding about groundwater resource systems and stimulate discussions about the need for institutional arrangements (rules).

The groundwater game was played in Southern Nations, Nationalities, and Peoples' Region of Ethiopia and in the Upper East Region of Ghana. These are unique contexts where small-scale irrigation is expanding, but overextraction and competition over groundwater have not yet reached alarming levels. Thus, with good governance both the resource and livelihoods can be sustained.

Women's group plays the groundwater game in Ghana. *Photo: Emmanuel Obuobie.*



Dida Halibo Kebele, Ethiopia. *Photo: Fekadu Gelaw.*

Reshaping mental models around groundwater

Many users share groundwater resources without realizing their interconnectedness and the resource dynamics at play. **Understanding the biophysical and systems' characteristics of natural resources, the social dilemma in common-pool resources management, and the need for cooperation can aid communities in forming institutions to address governance challenges.**

The game takes players through multiple rounds, each representing a year, where they can experience in a short period of time how choosing between a Crop A (low water use, low income) and Crop B (high water use, high income) influences groundwater levels, and how each person's choices affect the overall resource. Players first make decisions without communicating, and in later rounds are allowed to discuss planned decisions and develop rules for more sustainable groundwater management.

The game is designed to be used by field staff of NGOs, government extension services or other facilitators of community natural resource management processes.

The game resulted in different kinds of experiential learnings, including cognitive learning, normative learning and relational learning

A facilitator in Ghana explains the game to participants. *Photo: Nicole Lefore.*

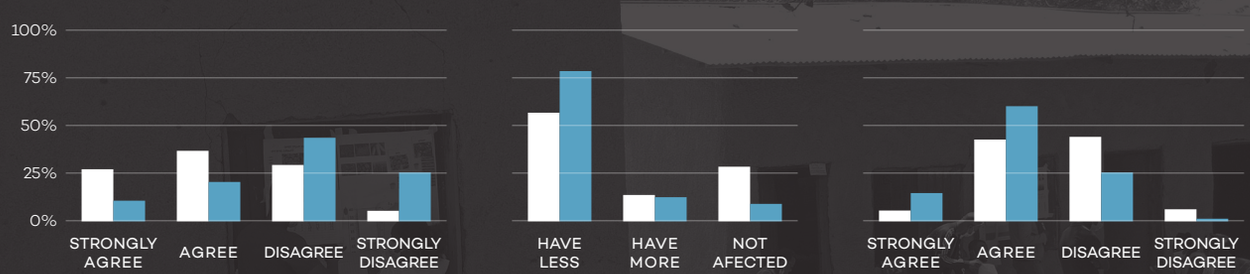
The groundwater game experience had a clear effect on shifting mental models regarding the characteristics and use of groundwater resources (see below).

Before the game, most communities did not perceive groundwater as a shared or depletable resource, but rather as private property that was not affected by crop choices, and intensity of use. Following the game, farmers realized that groundwater is a common-pool resource and that their individual choices have an impact on availability for the whole village. Additionally, the participants recognized the value of communication and collective action in resource management, as well as the necessity of groundwater rules for better groundwater management.

Spillover effects: Game players and other community members gathered to reflect on lessons learned

The games are followed by community-wide debriefing discussions, an essential part of the process to reflect on the experience and lessons learned, and to stimulate discussions around groundwater governance among game players and other community members for wider learning.

Before and after game mental models regarding water resources in Ethiopia



Farmers should be able to grow whatever crops they want, without any rules restricting which crops may be irrigated

Farmer's expectation of groundwater availability if other famers around start pumping more ground-water for irrigation

Groundwater use now will affect the sustained availability of the resource in the future for the community as a whole

BEFORE GAME AFTER GAME N=150 *Source: pre-game and post-game player survey*

KEY POINTS:

Not a silver bullet

- To empower communities to self-govern their common resources, the games should complement existing participatory activities. They work as catalysts to encourage discussions within the community, to prepare water management rules and strengthen local governance. Communities themselves discuss and prepare their own strategies as this will more likely lead to actual behavioral change.

Building community capacity takes time

- While the games are a promising first step, they need to be coupled with other interventions to provide communities with the information and technical skills to manage their groundwater resources effectively.

6 months, 1 year, and 2 years later, communities still remember the games and the lessons retained

In Ethiopia, six months after the game was implemented communities remembered the importance of communication, rules and collective action for groundwater governance. Some community members suggested introducing turns for groundwater irrigation and practicing soil and water conservation activities. In Ghana, one year after the game intervention, focus group participants from treatment communities frequently mentioned that they started to select crops based on (lower) water requirements, limit planting of water intensive crops, and created water saving schedules to manage water use. Two years after the games were implemented in Ethiopia, the learning experience still resonates with farmers. As one of them reflected: "When the water goes down, we remember the games."

"We used to think that we have our own independent groundwater source since we have independent wells."

WOMAN PLAYER IN ETHIOPIA

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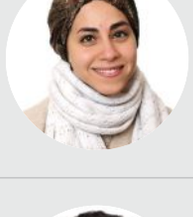

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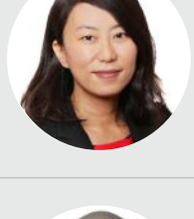

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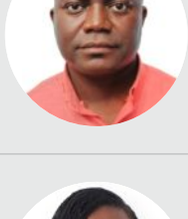

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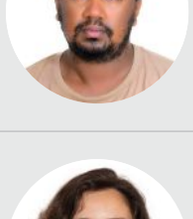

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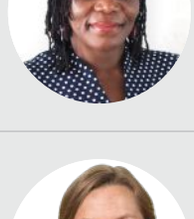

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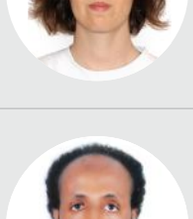

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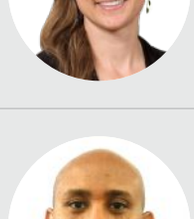

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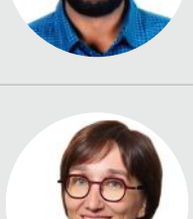

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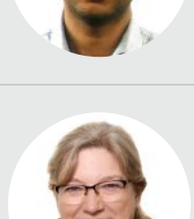

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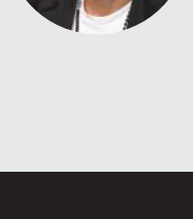

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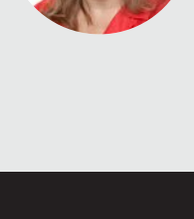

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