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

Photo: Mulugeta Ayene/WLE

Experiential learning: Groundwater games and collective action in Ethiopia

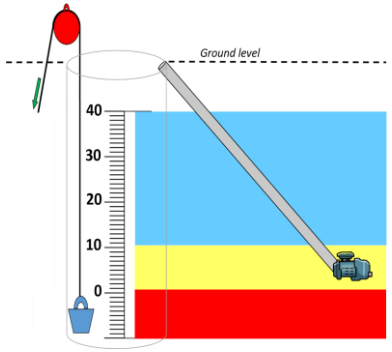
Hagar ElDidi - IFPRI

USAID FROM THE AMERICAN PEOPLE · The Borlaug Institute · Texas A&M AgriLife Research · The Texas A&M University System · IFPRI International Food Policy Research Institute · IWMI International Water Management Institute · ILRI · World Vegetable Center · HWISE-RCN

RESEARCH/PROJECT

Innovation Lab for Small Scale Irrigation (ILSSI)

Activity 3.1.1. Pilot experiential learning in groundwater governance



- Games are useful for identifying behavioral patterns and shaping mental models
  - Raising awareness and stimulating discussions about the biophysical characteristics of groundwater, the social dilemma, and the need for institutional arrangements
- Research focuses on:

  1) The immediate learning effect of the game on participants; comparing before- and after-game individual mental models

  2) The mid-term effect of the intervention (game and community debriefing) on the communities
- The game:
  - Different crop choices with different water use & returns
  - 3 game treatments: No communication, communication, communication and rules

KEY LESSONS FOR SMALL SCALE IRRIGATION AND CLIMATE CHANGE

- Visible shifts in immediate mental models before and after the game:
  - Groundwater is a shared and depletable resource
  - Communication, collective action, and rules are important for governance
  - Crop rotation and crop choices affect groundwater availability

"Before the game I didn't think that groundwater can get lower and lower by our crop choices in irrigation. But after the game I have a lot of information about how to save and use our groundwater."

Female, Googeiti 1*

*Village community has no water rules; people don't think they should have rules

Our current groundwater use will affect the sustainability of the resource

	Before		After	
	Freq.	%	Freq.	%
Strongly agree	8	**5.3**	22	**14.7**
Agree	64	**42.7**	90	**60.0**
Disagree	66	**44.0**	37	**24.7**
Strongly disagree	9	**6.0**	1	**0.7**
Not applicable	3	**2.0**		

Need collective action to establish and maintain community water structures

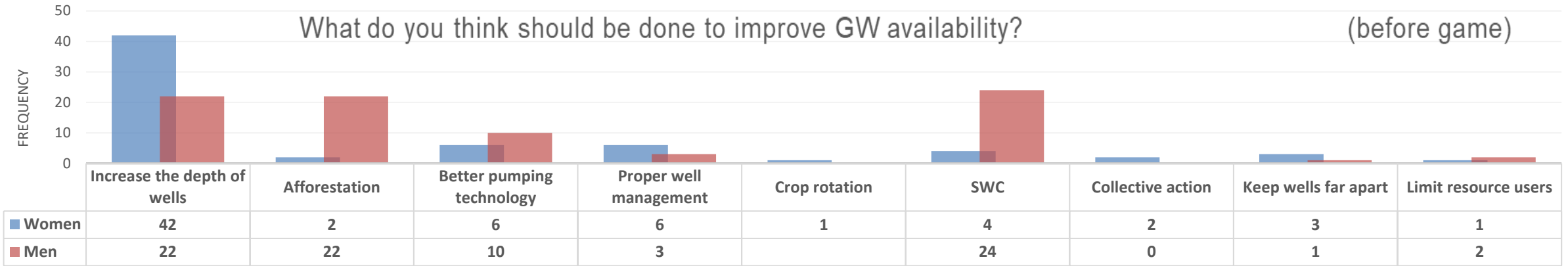
	Before		After	
	Freq.	%	Freq.	%
Strongly agree	68	**45.3**	65	**43.3**
Agree	79	**52.7**	79	**52.7**
Disagree	3	**2**	1	**0.7**
Strongly disagree			5	**3.3**

No need for rules restricting type of crops to be irrigated

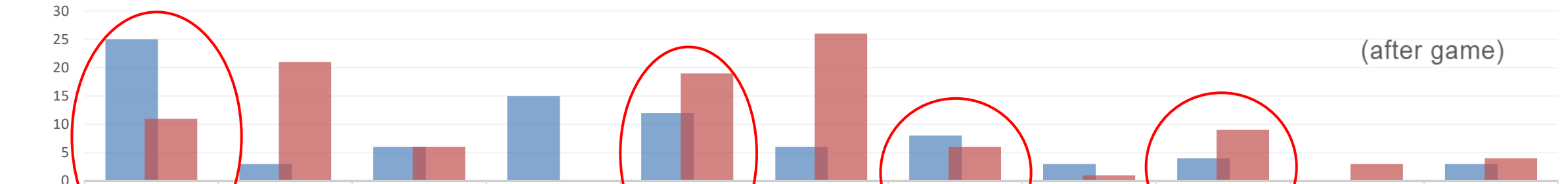
	Before		After	
	Freq.	%	Freq.	%
Strongly agree	41	**27.3**	16	**10.7**
Agree	55	**36.7**	31	**20.7**
Disagree	44	**29.3**	65	**43.3**
Strongly disagree	8	**5.3**	38	**25.3**
Not applicable	2	**1.3**		

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

KEY LESSONS FOR SMALL SCALE IRRIGATION AND CLIMATE CHANGE



	Increase the depth of wells	Afforestation	Better pumping technology	Proper well management	Crop rotation	SWC	Collective action	Keep wells far apart	Limit resource users
Women	42	2	6	6	1	4	2	3	1
Men	22	22	10	3		24	0	1	2



	Increase the depth of wells	Afforestation	Better pumping technology	Cleaning the wells from mud	Crop rotation / growing water saving crops	SWC	Collective action	Keep wells far apart	Implementing rules	Collecting rain water	Teracing
Women	25	3	6	15	12	6	8	3	4	0	3
Men	11	21	6	0	19	26	6	1	9	3	4

USAID FROM THE AMERICAN PEOPLE · The Borlaug Institute · Texas A&M AgriLife Research · The Texas A&M University System · IFPRI International Food Policy Research Institute · IWMI International Water Management Institute · ILRI · World Vegetable Center · HWISE-RCN

KEY LESSONS FOR SMALL SCALE IRRIGATION AND CLIMATE CHANGE

- Post-game community debriefing discussion is crucial for community-wide learning and spillover effects

"rules for groundwater are not possible but for surface water one can't block the flow of a river to irrigate his farm. Such surface water related issues need rules and regulations because it is a shared resource…one can't accuse me if there is no groundwater in his well."

- Community member, non-player

"This is what the game was all about! [explains purpose of the game]"

- Player

Women's group playing the game, March 2021
Photo credit: Fekadu Gelaw

KNOWLEDGE GAPS

What information is needed going forward, to improve project and program design and implementation for irrigation

- Endline data analysis in progress: Determine whether the change in community-level mental models sustain overtime
  - Observe changes in governance of groundwater, rules, etc.
- Monitor GW changes to see longer-term effects on resource sustainability; separating effects of climate change from effects of groundwater governance is a challenge
- Team-up with extension officers to support community members in determining local water-saving vs water intensive crops