Fishery Game Practitioner's Manual











Suggested citation: Games for Sustainability (2017) Fishery Game Practitioner's Manual, <u>www.gamesforsustainability.org</u>, accessed date

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Acknowledgements

Funding: This work was undertaken as part of the CGIAR Research Program on Policies, Institutions, and Markets (PIM) led by the International Food Policy Research Institute (IFPRI). Funding support for this study was provided by the National Science Foundation and the CGIAR Research Program on Policies, Institutions, and Markets.

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Manual Compilation and Design

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Rationale for Fishery Game

Common pool resources, such as fisheries, are difficult to manage given that they are shared. Each resource user, or fisher, makes harvest decisions individually, but uncoordinated, individual decisions aggregate to affect the shared resources. Though many fisheries around the world are overexploited due to management challenges, in others, resource users have found ways to collectively manage the resource.

For long-term sustainability, harvest must not exceed the fishery's natural rate of replenishment. This game highlights the dilemma that fishers face in deciding where to fish and with what effort. Uncoordinated selfish behavior could lead to depletion of common resources in contrast to a more coordinated spread of a limited fishing effort that sustain fish resources.

This manual is intended to provide step-by-step instructions for those who would like to facilitate this game; an interventional learning tool to be used in contexts where the shared resource or resource users are at risk of experiencing diminishing quality or quantity of a resource due to collective management challenges.



Why play a game?

Traditionally, field games have been used as experimental tools to understand human behavior. However, recently, games have shown promise as tools for learning among participants. Games are powerful learning tools because they simulate change over time and thus give participants the opportunity to experience what is in reality a longterm change over a span of a few hours. There are multiple reports of anecdotal evidence that suggest that games focused on resource management strategies are used as reference points for determining management decisions in reality.

However, the game itself is, perhaps, less important than the discussions that follow. Important for facilitators to understand is that these games are not meant to teach people what to do, but meant to stimulate conversation about issues at the community level.

This fishery game is one in which players make individual management choices regarding the area in which they fish and how much to fish, but they experience the impact of uncoordinated decision-making because each individual decision impacts the state of the resource. Thus far, this game has been used in Colombia and Thailand.

Using this Manual

This manual is for NGOs, trainers who are involved in community groundwater projects, and government employees who work with communities.

This manual includes:

- 1. A game kit checklist: provides a brief description and visuals of each item that needs to be gathered to play the game
- 2. The Game Roles: Facilitator and Record Keeper
- 3. **Preparation for the Game:** instructions for preparing facilitators and communities
- 4. Instructions for Play: step-by-step instructions for how to play the game
- 5. Game variations
- 6. Suggestions for a post-game discussion

- 7. Contribute to the game's evolution!
- 8. Appendix with printable materials

Materials Needed

Fishery Game Hang-ups: Payoff Table (can be made using pictures or numbers) and zone status. These can be posters or whiteboard.



An erasable marker: used to designate the state (high or low payoff) of each of the fishing zones.



Supplies to hang up the posters: tape, string, etc.

Numeric payoff table that can be printed on a poster or drawn on

Payofi jable made with pictures of fish. Pictures of fish are moved ble.

Fishery game Effort zone A effort zone B ชุกชุมน้อย n. Time step 0 เกมการประมง 5. ห์วม ก วอบที่ State zone A บันรวมใ 5 571 ห่อบ 2 State Zone B -

Whiteboard with zone status and total fishing effort made in each zone that can be modified each round. Round number is displayed as "time step."

Player calculation sheet						
Player no: Time:						
	Place:					
		Date:				
Round	Α	В	С			
	N	ly Decisions	My points			
	Place	Effort				
	(A/B)	(0,1,2)				
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1						
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2						
Practice						
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1						

	2					
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Decision Monitor Card: should have enough spaces for 10 years plus the additional three practice years.

Monitor calculation sheet							
monitor	•						
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Date:							
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		(Pla	ce / Ef	fort)		eff	ort
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2							
3							
4							
5							
6							

Fishery Game Roles

FACILITATOR	RECORD KEEPER			
SKILLS NEEDED				
- Respect everyone – women, child - Include all players (give everyone - Facilitate instead of lecture INDIVIDU	dren, different castes, religions, etc. e a voice, chance to speak) AL SKILLS			
 Knowledge of factors influencing fisheries Listen to community members and Respond appropriately Encourage participation and discussion, avoid lecturing 	- Legible handwriting - Record keeping SIBILITIES			
PREPAI	RATION			
 Work with local staff and the village institution to set a date and time to play the games Prepare the Game Kit, ensure all pieces are present Lead practice game sessions prior to playing with a community 	 In charge of tracking zone status via during the game using the monitor card, take notes during discussion Consider the best locations for everyone to see the game and props 			
GAME	PLAY			
 Lead introductions Explain how to play the game and answer questions Ask questions as needed to facilitate group discussion Decide when to change rounds prompt players to talk in discussion 	 Record the decisions for each player by marking the decision monitor card Announce zone status at the beginning of each round after decisions are made and modify the hang-ups accordingly Enforce the rules - keep decision making time and talking to 1 minute Take notes of anything new or interesting players say or do during the game if it supports your project 			
DEE - Introduce the debrief - Facilitate players explaining the game - Guide the community discussion to link the game with real life	RIEF - Take notes of what the community is saying when useful to the project - Support the Facilitator by providing alternative explanations to the community to improve understanding			

Preparation and Play

Pre-Game Day Preparation

1. Practice the game: Practice the protocol a number of times with volunteers. You need to get used to the logistics of the instructions, paperwork and calculating the payments. You may also adjust the protocols better fit your local conditions.

2. Community Preparation:

- Coordinate with the village and/or field staff to select a good date and time of day for the game(s) and debrief when most people can attend.
- Determine how many games will be played and where they will be played (site selection)
- Find participants! Best to consult with village leaders of field staff to determine how best to reach out to community members

TIP!

When you start using experimental games, use them initially with communities with whom you have a good relationship and where there are no serious conflicts within the community.

Gather all of the needed materials

TIP!

When choosing a game site, ask yourself the following questions:

-Distance from village?

-Will everyone feel welcome?

-How many people can sit in the area? Is it big enough?

-Is there space to hang up the posters? -Time of day:

In the evening, will there be enough light? A lantern or more central location to the village may be best

In the morning or early day, find a spot that will remain shaded, especially when it is hot



Game Day

- 1. Welcome Everyone!
 - Introduce yourself and the topic of the game

Good day. My name is _____ and I work with _____ (name of organization) in _____ (location). We came here to play the fishery game.

- Ask the participants about themselves. What is your name? What do you do?
- If possible, personalize the game for the group Where do you fish? What kind of fish do you harvest or eat? What equipment do you use?

2. Explain How to Play

1. In this game you are a fisherman/woman that fishes in two different locations- zones A and B [point to poster that displays the two zones]. In each round of the game you have to make two decisions. First, you decide in which location to fish. Second, you decide how much time

and effort you spend fishing, which is represented by three effort levels: 0,1, and 2. The game is played for ten rounds and each round represents a year. The decisions you make affect how much you harvest in each round as well as the state of the resource for the next round.

2. As you can see here [point to poster or payoff table], the resource, or zone, can have a low or high payoff level (which is the number of fish harvested at each effort level) depending on how much has been fished there previously. The game begins with



each zone having a high payoff, but this changes during the game. When five or more units of effort are placed in one zone, it depletes to a low payoff. When no more than one unit of effort is located into a low payoff zone for two successive years, it changes back to a high payoff. The state of the resources will be announced at the beginning of each round. Any questions so far?

3. Each of you will make decisions individually. In front of you there is a player decision sheet.

In each round, you record your decisions here and then the record keeper [introduce who that is] will come around and collect these sheets. They will record how many units you harvest as well as calculate the state of the resource (low or high payoff) based on the group's aggregated decisions. Then, they will announce the state of the resource at the beginning of the next round and record it here [point to visuals].

4. The game will be played for ten rounds but we will begin with a few practice rounds. The objective of the game is to make decision that allow you to harvest



as much as you can during the ten rounds. Any questions?

TIP!

Remind players that:

- All decisions should be made individually
- They should inform you if they have difficulty reading or writing and, if so, one of the monitors will assist them.
- They may have heard others in the community talk about the game but those comments don't necessarily apply to this exercise.

TIP!

It is likely that community members may come and go as the game is played. Some will see the game being played and want to join. Others may have something to do and need to leave. The game is flexible and seeks to include as many community members as possible. They are free to come and go as they would like.



3. Communication Rounds

Explain that: until now, you played the game without talking. You played like this was your fishing livelihood. Without discussing anyone else's decision, you harvested fish. But is that happening in real life? [Open the conversation to briefly discuss if knowledge about where and how much to fish is discussed among the fishing community]

Whether or not your decisions are affected by the decisions of others in real life, we are going to play the next ten rounds of the game as though you do share information about the fishery and your harvesting decisions with others before making a final decision about where to harvest fish for the day. So now all 5 of you can sit together and discuss what are good strategies for distributing fishing effort evenly across the two zones.

In the first game, you did not share your decisions with others. This round, you can. No problem.

Now you have 1 minute to decide together where each of you will fish and how much effort each of you will put into fishing so that everyone can share their voice and make decisions cooperatively.



Play for 10 more rounds with the new rule!

4. Other Variations of the Game

- Multiple species variation: One might design a version of the game in which there are two different species of fish to be harvested. Instead of different efforts the player chooses between two species, where one is more profitable than the other. However, the collective effort affect the productivity of the fishing location since the fish species depend on each other.
- Gear Variation: a version in which the different values of effort for harvest represent different kinds of fishing gear might be implemented. In this version, greater effort might represent a net that, though it catches more fish, also catches more bycatch. There might be thresholds of bycatch levels that, when reached, could tip the fishery into decline as ecological balance is disrupted.
- Coping with external shocks variation: In this version, in each round there is a chance that something external to the group of resource users will affect the state of the fishery. These shocks might come in the form of large fishing boats (i.e. trawlers) that rapidly deplete the fish stock, a hurricane that disrupts fish breeding zones or damages boats so that people are unable to exert fishing effort, or a group of other fishers, such as whales, might enter the system and deplete the stock. These shocks can be modified and specified to fit the specific context in which the game is played. To implement this one can use a dice to define whether an external event happens. For example, one throw the dice for each location, and if a six is thrown, an extra effort equivalent of two is added to the location.
- A variation for play that does not require literacy: Instead of using player decision cards and a monitor card, the game will be played with tokens. The Record Keeper will have two bags, A and B, and each will have different colored tokens. In total, at the beginning of the game, each bag will have 40 tokens. The monitor will go around to each participant and the participant will choose which bag to harvest from (drawing the amount of fish that corresponds with the effort table). High harvest zones switch to low harvest zones when there are 17 or fewer fish still in the bag. Low harvest zones replenish back to 40 if no more than 2 are taken out of the bag for two successive rounds. The taken tokens will correspond to a visual board (see materials section) that is modified accordingly during each round by the facilitator or record keeper.

Post-Game Discussion

For the discussion, invite a broader sample of the community, beyond those who participated in the game. There are different ways to organize the post-game discussion. Below are some suggestions:

 Trend Line Analysis: In a discussion with the community a history for the last 30 years or so is created. Make it visual and do not ask just what changes have occurred but why certain changes occurred.

Fishery TREND LINE EXERCISE



When mobilizing the community, request elders who have a good knowledge of the village's history.

Let's discuss your real life situation. We will go back over the past 30 years.

Point to the Trend line on the sheet of paper. Write "30 years" on the left end of the line. Write "Now" or "Today" on the right end of the line.

	2017
1990	NOW

Ask the community for 3-5 key milestones in the community's history that highlight major events over the past 30 years. This helps with memory recall throughout the game. For example:

-When was the school built?

-When was the village electrified?



Ask a series of questions and write the response on the trend line. Start with the 1st fueled boat in 1990, ~30 years ago:

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-How was the fishery? Which spots did you fish in?
-What fish were you primarily harvesting?
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1990 2000 2010 2017 Ist fueled boats Current Chief Local Leader Seed Village Minister of AP Elected Institution elected established The fish harvested were...

Go to the next milestone, 2000, ~20 years ago. Ask the set of 3 questions again. If there are any changes from the previous points, ask: **Why?**

Fishing Locations	Fish Species
Why did you stop fishing	Why did you shift the
	harvesting? Why are there no more of X type of fish?

- Another element for the debriefing is to ask the participants in the game to explain to others what the game was like and how it was played. What were some choices you made in the game and what were the consequences? Was the game realistic, why or why not? What did you learn? Was the game useful? Discuss the trend line....does that which was learned support or go against the current trend of the resources?
- If available, present any site-specific data that you have regarding their resource
- Finally, ask: What could be done to change/improve resource dynamics/trends here?

Contribute to the Game's Evolution!

Though this manual provides a game protocol, we encourage users to use this as a starting point. Many of the variations listed in this manual have been developed so that the game better fits their specific contexts and we encourage all users to do the same!

Please contribute to building and evolving this resource! Connect with us via the contact page on our website or by Facebook to share reflections and thoughts from your experience implementing the game and to share any variations that you create. We can add this information to and credit your work in the manual.

Facebook Group: Games for Sustainability

Website: www.gamesforsustainability.org

Materials Appendix

Player calculation sheet							
Player no: Time:							
		Place:					
		Date:					
Round	Α	В	С				
	My Decisions My points						
	Place (A/B)	Effort (0,1,2)					
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Pract 2							
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Player calculation sheet							
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	Place (A/B)	Effort (0,1,2)					
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Player calculation sheet						
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	My D	ecisions	My points			
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	My D	ecisions	My points		
	Place (A/B)	Effort (0,1,2)			
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Monitor calculation sheet							
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