

## Appendix 1. Protocol for Experimental Game, Survey, and Community Debriefing

### Groundwater Field Experiment Protocol

*[FACILITATOR: Make sure everyone is sitting and not distracted by other matters. Read aloud, from the script, and always alert to any questions; be alert for facial expressions of the participants to detect lack of understanding of the activity.]*<sup>1</sup>

#### Instructions to read to the participants

Hello, I am \_\_\_\_\_ from FES. As a part of our hydrology project, we want to understand how you make your decisions on what crops to plant. This is a voluntary experience for you to help us to understand what you do. In case there is something you do not understand during the instructions, we invite you to raise your hand and we will be glad to respond to any question. We ask you to turn off your mobile phones to avoid any distractions during the activity. You are free to leave any time you wish, however if you leave, this session will end for everyone else also.

The types of crops that you choose to plant affect how much groundwater is used and how much money you make. We all know that crops like paddy and sugar cane require more water to grow than crops like groundnut and ragi, but paddy and sugar cane also can fetch more income than groundnut and ragi. Isn't that so?

So, if everyone grows paddy or sugar cane, then the groundwater levels are likely to fall more than if everyone grows groundnut or ragi. Does that make sense?

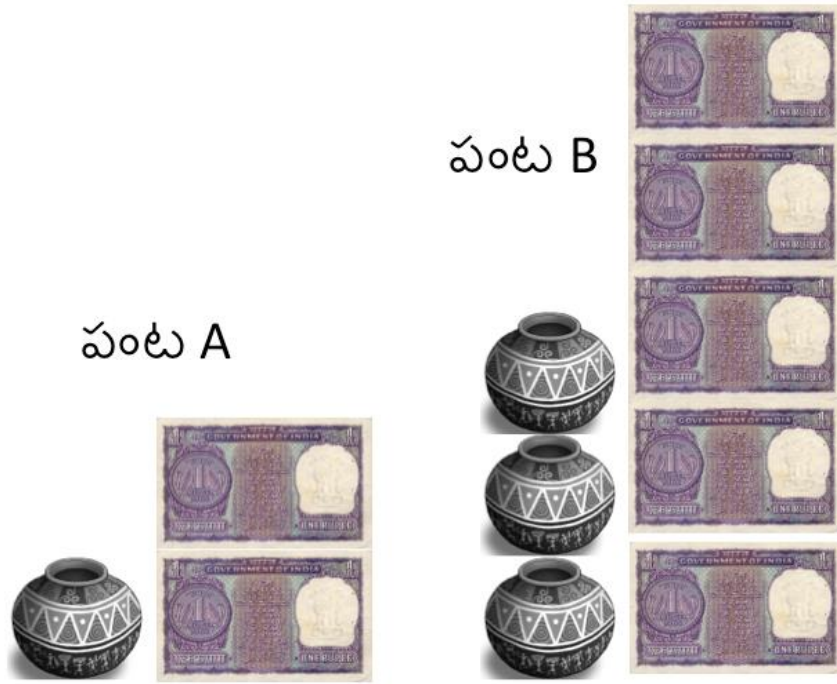
*[Wait for responses]*

We are going to play an activity that looks at how people make these decisions of what crops to plant. This is not a test; it is just an opportunity for you to make decisions just like you do all the time. But in this situation, you will be playing through several years of planting crops in a short period of time. This activity is very simple, and it doesn't include all the things that you usually deal with in your fields. We are just focusing on the *rabi* season, which depends only on *boru* (groundwater). And we are focusing on how you decide between planting one or two different kinds of crops. They are not actual crops that you use; they are pretend crops. One requires a little amount of water to grow and it gives you a small amount of money. We will call that Crop A. The other crop requires more water to grow but gives you more money. We will call that Crop B.

*[ONLY for the Individual Payments treatment:] You will be paid cash at the end of this session based on the crops you choose to plant.*

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<sup>1</sup> Text highlighted in gray are instructions for the experimenters.



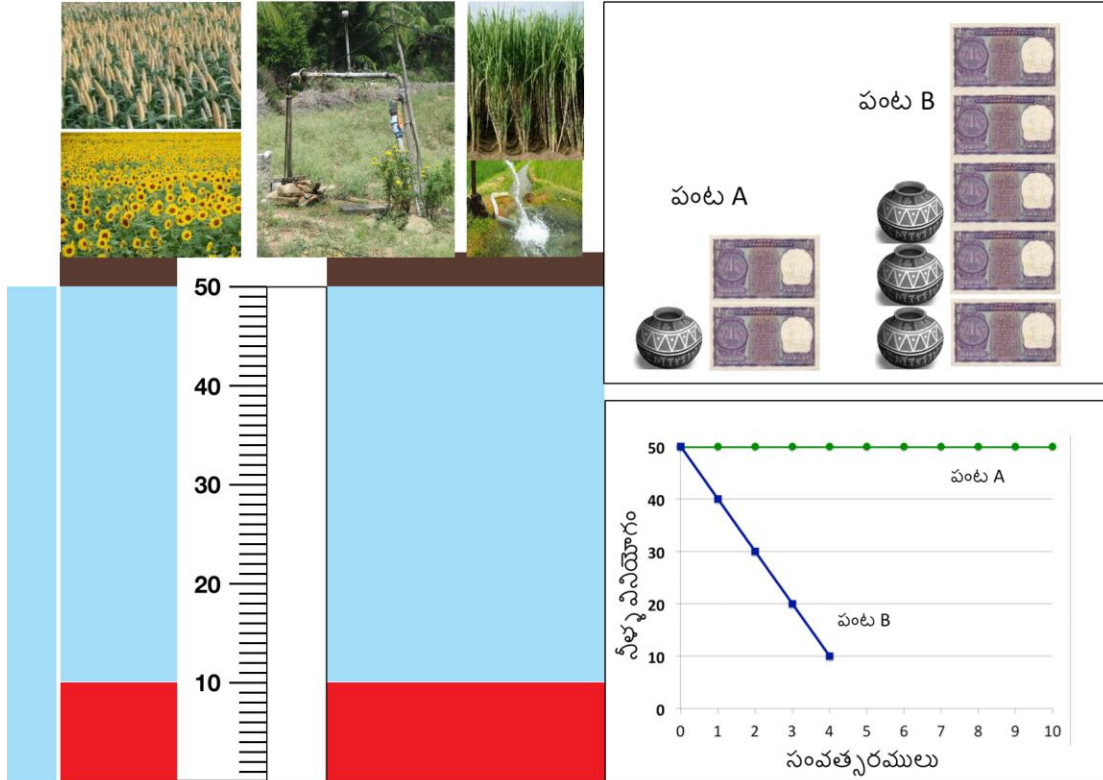
**Figure 1. Crop A/B Comparison**

Any Questions? *[Wait for any questions]*

We will begin by playing an activity. After we have finished playing the activity, we will have a discussion period to allow you to talk about the activity and your thoughts. When we have completed our discussion, we will play the activity again so you can try out the ideas that you may have talked about. During the first activity, you are asked not to speak; we also ask that you not tell other people in the village about this activity until the community meeting. During the second activity, you will have 45 seconds to talk after each year to discuss your plans.

This activity is intended to recreate the situation in which people must make decisions about using water to grow crops. You have been organized into a group of five individuals. You will play a number of years, which have one pretend growing season, when all your water comes from groundwater. Though each of you may have different amounts of land, for this activity you should pretend that you all have the same amount of land, say 1 hectare.

At the beginning of the activity, there are 50 units of groundwater available for your group to grow crops. The amount of groundwater available is shown on the board as blue water in a bore well. As water is used, we will move the blue column down to show you how much groundwater is remaining. Every year, you will have to make a decision, which of the two crops to plant: Crop A or Crop B. Crop A costs one unit of water and gives two units of income. Crop B costs three units of water and gives five units of income. At the beginning of each year, the groundwater supply recharges by 5 units of water. We will show this recharge happen by moving the blue column up by 5 units of water in the bore well.



**Figure 2. Water Level Indicator**

So looking at our picture of a bore well, if everyone plants crop A, 5 units of water will be used, leaving 45 units of water. At the beginning of the next round, the groundwater will recharge with 5 units of water, so there will be 50 units of water available for the group.

If everyone plants crop B, 15 units of water will be used, leaving 35 units of water. At the beginning of the next round, the groundwater will recharge with 5 units of water, so there will be 40 units of water available.

If some people choose Crop A and others choose Crop B, then the amount of water that will be used will be between these two possibilities.

*[ONLY for the Individual Payments treatment, state:] At the end of the game, we will pay you Rs 5 for every unit of money you earn in this game. So if you earn 20 units of money in the game, we will give you 100 rupees. We will give you your earnings in private, so that no one else knows how much you made.*

We will play the activity for a number of years. If the groundwater level drops below 10 units of water, which is marked here with this red line, for simplicity's sake, the activity is ended due to insufficient water for the group.

When the activity is ended, we will begin a discussion period, where you can talk about the activity, and share any thoughts or observations you may have about your experience. After the

discussion session, we will play the activity again, starting with a fresh groundwater supply of 50 units.

I will now describe how we will play the activity in detail. We are handing each of you a piece of paper, your Decision Form. Each year, you will choose which crop to plant by circling one of the two options in the “My Crop” column. Circle “A” if you want to plant crop A, or circle “B” if you want to plant crop B. We will come around to record which crop you want to plant, and we will write how much income you receive for your crops in your Income column. Hold the Decision Form in your hand so only we can see which crop you have chosen to plant.

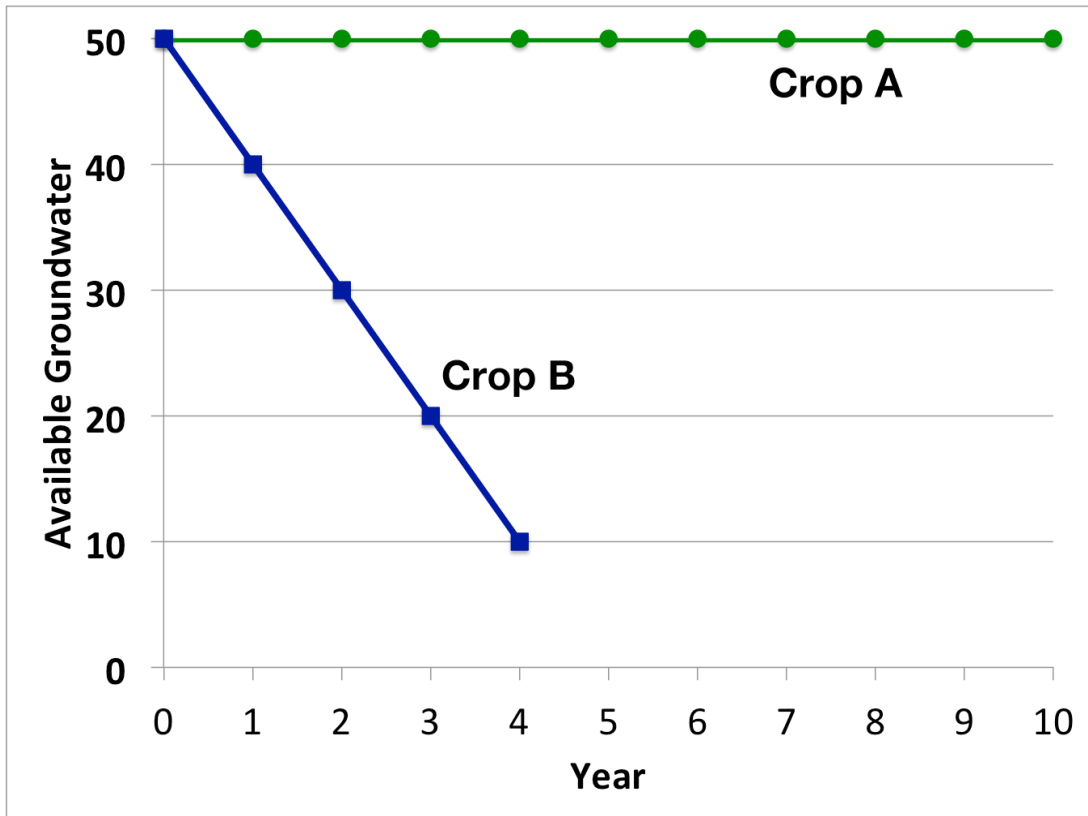
Decision Form			
Participant: 1			
WS:	Vill:		HU:
Group: 1 / 2	Game: 1		
	My Crop		My Income
Practice	A	B	
Practice	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	
	A	B	

**Figure 3. Participant Decision Form (also shown in large-format to participants for instruction)**

We will calculate how much water the group has used, and we will move the blue column down to show you how much groundwater remains. This is the end of the year.

At the beginning of the next year, we will move the blue column up by 5 units of water to show you the groundwater recharge and announce how much groundwater is available to your group.

So for example, if everyone were to plant Crop A every round, the groundwater supply will fully recharge every round. Each participant would earn a total of 20 units of income from their crops.



**Figure 4. Comparison of Everyone Playing A vs Everyone Playing B (AAAAA vs BBBB)**

If everyone plants Crop B every round, the groundwater supply would last for 5 rounds. Each participant would earn 25 units of income from their crops.

Keep in mind that your decisions are private, and everyone can decide for themselves which crop they wish to plant each round. This means when you show us your Decision Form, only we see the crops you circled on your form.

Do you have any questions about this? *[FACILITATOR: pause to resolve questions.]*

Keep in mind that from now on you are not allowed to talk to each other until we tell you it is ok for you to do so.

First, we will play three practice years that will not count toward the results of the groundwater levels. These practice rounds are just an opportunity for you familiarize yourself with the activity.

After we have completed the practice years, you will have another opportunity to ask any questions you may have. After that, we will begin the actual activity.

## **Practice Year:**

*[FACILITATOR: If this is the second practice round, add 5 units of water to the groundwater diagram.]*

This is the beginning of a new practice year. [5 units of groundwater have recharged.]<sup>2</sup> There are \_\_\_ units of groundwater available. Please make your decision on which crop you will plant for this round, Crop A or Crop B. Please carefully show your Decision Form to the monitor when they come to you.

*[MONITOR: Write down each participant's crop decision on the Monitor Form. Calculate the amount of water used, and the remaining water. Show these numbers to the Facilitator.]*

For the practice years only, we are going to tell you how many people chose to plant crop A and crop B, so you can tell us how many units of water was used, and how many units of income each person received.

\_\_\_ people chose to plant Crop A, and \_\_\_ people chose to plant Crop B.

How many units of water have been used?

How many units of income do the people who planted Crop A receive?

How many units of income do the people who planted Crop B receive?

*[FACILITATOR: If this is not the last practice round, return to the beginning of the practice round instructions above. Otherwise, continue to the Beginning of the actual activity rounds below.]*

[That was the last practice year. Do you have any questions?]

[Look for any questions]

[We will now reset the groundwater level to 50 units of water and begin the real exercise.]

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<sup>2</sup> Text underlined inside brackets is conditional. Only recite this text if it applies to the current status of the activity (as in there is recharge for years following the first year.) Skip it if it doesn't apply now.

## **ACTIVITY 1: YEARS WITHOUT COMMUNICATION**

*[FACILITATOR: If this is round 2 or later, add 5 units of water to the groundwater diagram.]*

This is the beginning of a new practice year. [5 units of groundwater have recharged.] There are \_\_\_ units of groundwater available. Please make your decision on which crop you will plant for this round, Crop A or Crop B. Please carefully show your Decision Form to the monitor when they come to you.

*[MONITOR: Walk around to each participant and write down their crop decision on the Monitor Recording Form. Calculate how much water has been used by the group's crops. Announce how much water was used by the group.]*

*[FACILITATOR: subtract the water usage from the water level poster.]*

*[FACILITATOR: If the remaining amount of groundwater is less than 10 units, announce the end of the activity. Otherwise, move to the next round.]*

IF CONTINUE TO NEXT YEAR:

This year has now ended.

END ACTIVITY:

[There is no longer sufficient groundwater available for the group.]

This was the last year and the activity is now ended. We are now going to gather your Decision Forms and we are going to discuss your experience in the exercise.

*[MONITOR: Gather the participants' Decision Forms. Store the forms in the correct envelope.]*

*[FACILITATOR: Use the Discussion Guidelines to ask questions and encourage talking between the participants.]*

*[RECORDER: Use the Discussion Topics Instrument to check off the topics that are brought up by the participants. Also write down any issues or interesting points that are brought up by the group.]*

## **ACTIVITY 2: YEARS WITH COMMUNICATION**

*[FACILITATOR: If this is round 2 or later, add 5 units of water to the groundwater diagram.]*

This is the beginning of a new practice year. [5 units of groundwater have recharged.] There are \_\_\_ units of groundwater available.

You have 45 seconds to talk with each other about the next year.

*[MONITOR: time the group for 45 seconds. When that time has elapsed, raise your hand so the Facilitator can announce that there is no more talking.]*

Your discussion time has ended.

Please make your decision on which crop you will plant for this round, Crop A or Crop B. Please carefully show your Decision Form to the monitor when they come to you.

*[MONITOR: Walk around to each participant and write down their crop decision on the Monitor Recording Form. Calculate how much water has been used by the group's crops. Announce how much water was used by the group.]*

*[FACILITATOR: subtract the water usage from the water level poster.]*

*[FACILITATOR: If the remaining amount of groundwater is less than 10 units, announce the end of the activity. Otherwise, move to the next round.]*

**IF CONTINUE TO NEXT YEAR:**

This year has now ended.

**END ACTIVITY:**

[There is no longer sufficient groundwater available for the group.]

This was the last year and the activity is now ended. We will gather your decision forms and hand you a short survey to be filled out. We will go over the survey with you. Thank you for providing this very valuable information.

*[Only in the communities that are to be paid individual earnings, say:]*

Once your questionnaire is filled out, we will give you your payment.

*[MONITOR: Gather the participants' Decision Forms. Store the forms in the correct envelope.]*

When the survey is done, we will shortly begin a community-wide discussion meeting about this activity, and it would be wonderful if you could join us all to talk about your experience and ideas from the activity. We will not tell anyone about how each of you individually played, or what you (singular) decided, but we hope you will feel free to share your experiences and ideas on how this game might apply to groundwater management in this area.

Thank you so much for you time and attention!



## Sampling

The primary unit for site selection are habitation units (in contrast to the higher level political unit, the panchayat.) 1 or more habitations compose a panchayat. There are on average 4 panchayats within each watershed. FES has five watersheds in which it has field teams. However, only four watersheds have habitations that use bore wells, a necessary contextual feature for the project. The participants need to use groundwater in their agricultural practices, which necessitates bore wells.

In these 4 watersheds, there are 17 habitations available for running the field experiments or control. To expand the number of field sites for the study, we contacted Jana Jagriti, a partner NGO, to invite them to participate in the project. They have 3 watersheds available to bring the total number of villages to 30 project sites. We will end up with 29 project sites because we used one of the available FES sites as a pilot test.

With 29 sites, we will divide the sites into unequal thirds for the two treatments and the control group: 10-10-9 (“earnings”-“flat-fee to community”-“control”).

### Sampling strategy:

- NGO staff will go to the community in advance tell the Watershed Committee about plans to do the games (or the surveys in the control sites). The Watershed Committee will be asked to select 7 women and 7 men from different households that use groundwater (no couples from same household), with a request that they select households with a range of holding sizes. Explain that we want to have a discussion and activity related to groundwater use, and we would like to invite men and women from households that uses groundwater to come to the meeting at X time. Those who participate would spend approximately 2 1/2 hours, but it is a rather fun activity and [depending on the type of community] we will make a donation to the community fund to recognize their participation OR they will have a chance to make some money—between 200 and 500 rupees. Ask the committee to select 7 each men and women, but explain that on the day of the game, only 5 of each will be needed.
- From those who show up, separate them into men and women. Put 5 slips of paper numbered 1 through 5 into a bowl, along with blank slips, and let each person draw a slip. Those with a numbered slip would play.
- Before the rest leave, check that no couples were selected (man and woman from the same house). If they were, let them “draw straws” or something else to randomly select which one plays. The other goes home, and is replaced by another man or woman.

When invited, the participant needs to understand that approximately **2 1/2 hours** will be required to participate (from being seated, through the exercises, discussion, and survey, to the end of the community debriefing.) If the person declines to participate, the recruiters move on to the next person on the list. Continue until all 10 participants have been recruited.

## **Session Organization**

Each field site will consist of two groups of five participants each. One group will consist of men only and the second group will consist of women. The gender-segregated sessions will ensure each group is willing and able to speak freely about the exercise and its relevance to their lives.

The goal is to complete a site in a single visit. Group sessions are held sequentially. The Community Debriefing is scheduled for later in the day or evening, when the entire village will be available to meet.

Upon arriving at a village to begin the group sessions, a brief introduction is read to the village:

Thank you for allowing us to visit your community today. Before we get started, we want to briefly explain why we are here. As you are aware, groundwater depletion is major problem in this area and we are seeing increasing incidence of crop failures due to unavailability of water. Watershed activities being undertaken aim to address the availability of water from both demand and supply side. Today we are here for an activity which is part of a research project. This research is being undertaken in collaboration with International Food and Policy Research Institute and Arizona State University. We have requested the watershed committee to select 5 men and 5 women from your community to participate in a series of small activities. These activities are designed to allow us to learn a little about your community and your farming situation. This will be followed by a village Gram Sabha where the selected participants will share their experience and we will discuss on the probable options to address groundwater management.

Although we would love to have everyone join us in these activities today, we are only able to work with the ten people already invited. We need to begin our work, and we ask the first group of (Men/Women) to join us in the meeting area. We ask the other group to leave for a while and come back later when we can meet with you. Everyone else, you are welcome to watch us, but we request that you stay outside of the area, and please do not talk.

Thank you!

Each group session will require a minimum of three individuals to run:

1. Facilitator
2. Monitor
3. Recorder

The Facilitator reads the instructions and answers questions about the exercise. He or she also updates the Water Level indicator on the pin board when announcing the new water levels after the crop decisions.

The Monitor records the crop decisions selected by the participants, and he writes their income on their Decision Forms. The Monitor also makes sure that the participants follow the rules (do not talk when not permitted, are not looking at each other's forms, etc.)

The Recorder writes down what participants talk about during discussion periods, using the Discussion Topic Instrument. They note who says what and notes any interesting discussions relevant to the history of the habitation. The Recorder also takes notes during the Community Debriefing.

When calculating the total number of trained staff required for the project, additional staff should be fully trained as redundant backups in case any of the primary staff become unavailable (due to sickness, family emergency, etc.)

In all sites, an FES hydrology team member will be the Facilitator. In the FES watersheds, the Recorder will be an FES field staff person, familiar with the habitation. In the Jana Jagriti watersheds, one of the JJ staff will fill the role of Recorder.

In the Individual Payment villages, following the end of the two games, earnings are calculated and a Payment Voucher is filled out and given to each Participant, indicating how much they will receive after they have filled out the Survey. In the Flat-Fee villages, the participant id number is given to the participant, to hold onto until they complete the survey.

The surveys are completed after the experiment sessions, during the break period before the Community Debriefing. Each field staff person sits with a participant and assists them with completing the survey. The Payment Voucher/Participant ID is used to ensure the survey is completed and marked with the correct Participant ID number. In the Individual Payment villages, after the survey is completed, the participant receives their cash payment.

## **Treatments**

There are two treatments, plus a control group. In the two treatments, all sites will participate in the same set of activities: An initial exercise without any communication, followed by a discussion period facilitated but not dictated by the Facilitator, and concluded with a second exercise that includes a 45-second discussion period between each round. Following the exercises, the participants will complete a survey and then be paid according to the assigned treatment.

In Treatment (A), the individual participants will be paid a fee according to their earnings in the two exercises. Each unit of income in the exercises will be worth 5 rupees. According to that figure, the minimum payment a participant can receive is 200 rupees (Choosing Crop A every round: 2 units x 20 rounds = 40 units x 5 rupees = 200 rupees), and the theoretical maximum that can be earned by an individual is 500 rupees (Choosing Crop B every round: 5 units x 20 rounds = 100 units x 5 rupees = 500 rupees). Because every participant is guaranteed a minimum payment of 200 rupees, no show-up fee is needed.

In Treatment (B), the community will be paid a flat fee for participating in the study.

## Documents & Forms:

In addition to the Checklist and this master Protocol document, additional forms need to be completed and translated into the needed site languages.

1. **Consent Letter** – All participants must read or have the Consent Letter read to them, so that we know they fully understand the meaning in the letter and so they can give their informed consent to participate in the project. **THIS IS CRITICAL. IT CANNOT BE SKIPPED, OR GLOSSED OVER QUICKLY.** Each participant must either sign a copy of the letter or their verbal consent must be recorded on the letter by a project staff person.
2. **Signup/Payment Form** – The name of each participant must be recorded into the signup sheet. At the end of the session, after each participant has completed their survey, they must sign that they have received the payment allotted for their project treatment.
3. **Scripts** - The session facilitators will need a concise script or bullet-point list of things to say every session. It is very important that the same things are said every time (and said the same way) and nothing is accidentally left out or added.
4. **Participant ID Tags** – Numbered slips 1-5 in plastic conference badges on lanyards, to make sure staff don't mix up participant positions. The participants wear the id around their necks for the session.
5. **Monitor Forms** – Two forms are needed for each group, one for each exercise (1 and 2). Ideally, the forms would be printed double-sided, so exercise 1 would be on one side, and exercise 2 on side two. Alternately, if double-sided printing is not possible, at time of printing each form pair should be stapled together. These forms need to be labeled correctly for the watershed, village, habitation, group, name of habitation (Location), and date and time, and game number (1 or 2). The watersheds, villages, and habitations need to be coded with numbers prior to the start of the project.
6. **Decision Forms** – The forms used by participants for recording their crop decisions each round and for the monitor to write their round earnings. Each participant will use two forms, one for each exercise.
7. **Discussion Topic Journal** – This is the form used by the Recorder to note what topics are discussed by the group during the discussion session. Who speaks and what they say should be noted.
8. **Survey Instrument**
9. **Community Debriefing Protocol**
10. **Habitation Attributes Instrument** – It may be very useful to use a standardized form for capturing the attributes of the habitation study sites currently recorded in FES' village records. The document included in the Dropbox folder is an example based off an attributes instrument from another study, which provides some example attributes that may be very useful (with tweaking.)

## Wrapping up Site Visit and Data Collection:

The Facilitator is responsible for collecting and securely storing all experiment forms. Double-check that all the forms have been completed fully and correctly: Session details are completed: Date, time, Watershed, Village, Habitation Unit, and Group number. It is critical that all this

information is filled out correctly on all the forms. Also make sure that the surveys are completed, and no questions are skipped (whenever possible.)

At the end of the day, the field staff should sit down and discuss the session. Record the team's observations in a journal: Did anything unusual happen? Did something go wrong or differently than usual? All of these details are useful, and when problems or surprises occur, it is very important to record that so they can be accounted for when analyzing the data.

**1A. Consent Letter: Individual Payments (Treatment A)**  
**CONSENT FORM**

**Watershed No.:** \_\_\_\_\_ **Village No.:** \_\_\_\_\_ **HU No.:** \_\_\_\_\_

**Group No.:** \_\_\_\_\_ **Participant No.:** \_\_\_\_\_

**Place and Date:** \_\_\_\_\_ **Time of the activity:** \_\_\_\_:\_\_\_\_ AM/PM

You have been invited to participate in an activity that is part of a research project about the management of natural resources, especially groundwater irrigation. Due to your experience with groundwater irrigation, your participation is very important for this research. The exercises and discussions will provide important information for all of us, including your community. The funding for this project came from international organizations.

The duration of the activity is three hours. There are no foreseeable risks for your participation.

At the end of the activity, you will receive an amount of cash depending on your earnings during the activity.

You will be participating in the exercise twice. In each exercise, you will earn income for your cash payment. Between the two exercises, you will have an opportunity to talk about your experience and thoughts of the exercise.

After the activities are over, we will call you forward one by one to give you a voucher that shows you how much money you will receive. \_\_\_\_\_ (date/time), we will meet with you and ask that you answer some questions on a short questionnaire about yourself, your household, and your community. Your thoughts and answers to these questions will be very helpful to us. What you earned in the activity and your answers on the questionnaire will be **confidential. This information will be used for academic purposes only.**

In addition to this activity you are invited to participate in a community discussion session to discuss the results of the activity. The discussion will be held in \_\_\_\_\_ at \_\_\_\_\_am/pm.

Your participation in the activity is completely voluntary. You may leave the activity at any time, and you will receive what you earned up to that point. However, if you decide to leave before the activity is over, the activity also ends for the other group members.

The cash payment that you earn during the activity will be given to you after you finish answering the questions on the survey. All decisions in the activity are made in private and we will keep your decisions confidential. However, we cannot control participants' conversations about the activity after the activity is over.

If you want a copy of this consent form, please ask us for it.

**1B. Consent Letter: Flat-Fee (Treatment B)**  
**CONSENT FORM**

**Watershed No.:** \_\_\_\_\_ **Village No.:** \_\_\_\_\_ **HU No.:** \_\_\_\_\_

**Group No.:** \_\_\_\_\_ **Participant No.:** \_\_\_\_\_

**Place and Date:** \_\_\_\_\_ **Time of the activity:** \_\_\_\_:\_\_\_\_ AM/PM

You have been invited to participate in an activity that is part of a research project about the management of natural resources, especially groundwater irrigation. Due to your experience with groundwater irrigation, your participation is very important for this research. The exercises and discussions will provide important information for all of us, including your community. The funding for this project came from international organizations.

The duration of the activity is three hours. There are no foreseeable risks for your participation.

Your community will be paid 2000 Rp. today as a thank you for everyone's participation in today's activities.

You will be participating in the exercise twice. Between the two exercises, you will have an opportunity to talk about your experience and thoughts of the exercise.

\_\_\_\_\_ (date/time), we will meet with you and ask that you answer some questions on a short questionnaire about yourself, your household, and your community. Your thoughts and answers to these questions will be very helpful to us. Your decisions in the activity and your answers in the questionnaire will be **confidential. This information will be used for academic purposes only.**

In addition to this activity you are invited to participate in a community discussion session to discuss the results of the activity. The discussion will be held in \_\_\_\_\_ at \_\_\_\_\_ am/pm.

Your participation in the activity is completely voluntary. You may leave the activity at any time.. However, if you decide to leave before the activity is over, the activity also ends for the other group members.

All decisions in the activity are made in private and we will keep your decisions confidential. However, we cannot control participants' conversations about the activity after the activity is over.

If you want a copy of this consent form, please ask us for it.

## Monitor Form

Monitor Calculation Form								
WS:	Village:	Habitation:	Location:					
Date:	Time:	Group: 1	Exercise: 1		Men / Women			
Round	Water Available	Player Crops					Water Used	Water Remaining
		1	2	3	4	5		
<b>Practice 1</b>	<b>50</b>							
<b>Practice 2</b>	<b>+ 5 =</b>							
<b>1</b>	<b>50</b>							
<b>2</b>	<b>+ 5 =</b>							
<b>3</b>	<b>+ 5 =</b>							
<b>4</b>	<b>+ 5 =</b>							
<b>5</b>	<b>+ 5 =</b>							
<b>6</b>	<b>+ 5 =</b>							
<b>7</b>	<b>+ 5 =</b>							
<b>8</b>	<b>+ 5 =</b>							
<b>9</b>	<b>+ 5 =</b>							
<b>10</b>	<b>+ 5 =</b>							
	TOTAL WATER UNITS:							
	TOTAL EARNINGS:							





## Discussion Journal

### Discussion Journal

Watershed: _____	Village: _____	Habitation: _____	Group: _____
Date/Time: _____	Habitation Name: _____		

Speaker	Topics

**Survey**

**INDIVIDUAL SURVEY**

<b>Staff Use Only</b>			
Date (dd/mm/yy) _____/_____/_____	Time _____:_____	Habitation Name _____	
Watershed _____	Village _____	Habitation _____	
Group _____	M/F _____	Participant _____	Surveyor _____

**SECTION I. RESPONDENT CHARACTERISTICS**

**Please answer for yourself**

1. How old are you? \_\_\_\_\_ years

2. Sex  Male  Female

3. Your Marital Status

1. Married  3. Divorced  5. Common law /Cohabiting  
 2. Widowed  4. Separated  6. Single

4. Your Caste

- OC  1  
OBC  2  
SC  3  
ST  4

5. What is the highest grade you have completed in school?

- None  0  
Adult literacy class  1  
Primary school (1-5)  3  
Secondary school (6-10)  4  
Intermediate (11-12)  5  
Technical School  5  
University  6

6. How long have you lived in this habitation? \_\_\_\_\_ YEARS

7. Who will work on your farm five years from now?

- You  1  
Child  2  
Other Relative  3  
Hired Labor  4  
Land Sold to Someone Else  5

8. Are you a member or leader of any community groups?

	Member	Leader
Water Committee	<input type="checkbox"/> 1	<input type="checkbox"/> 9
Water & Sanitation Committee	<input type="checkbox"/> 2	<input type="checkbox"/> 10
Panchayat	<input type="checkbox"/> 3	<input type="checkbox"/> 11
Self-Help	<input type="checkbox"/> 4	<input type="checkbox"/> 12
Forest Protection (VSS)	<input type="checkbox"/> 5	<input type="checkbox"/> 13
Farmer's Club	<input type="checkbox"/> 6	<input type="checkbox"/> 14
Mother's Committee	<input type="checkbox"/> 7	<input type="checkbox"/> 15
Other: _____	<input type="checkbox"/> 8	<input type="checkbox"/> 16

## SECTION II. HOUSEHOLD CHARACTERISTICS

**Please answer for your entire household**

9. Number of people (adults and children) who lived in house during last year for at least six months

	Male	Female
Adult	_____	_____
Children (under age 16)	_____	_____

10. How long has your family (ancestors) lived in this habitation?  
(For married women, answer for your husband's family)

< 4 Years	<input type="checkbox"/> 1
5 – 10 Years	<input type="checkbox"/> 2
11 – 20 Years	<input type="checkbox"/> 3
21 – 50 Years	<input type="checkbox"/> 4
> 50 Years	<input type="checkbox"/> 5

11. What are the sources of livelihoods for your household and which are the three most important (please rank in order 1, 2, 3)?

	Rank
Irrigated Farming	<input type="checkbox"/> 1 _____
Rain-Fed Farming	<input type="checkbox"/> 2 _____
Animal Husbandry	<input type="checkbox"/> 3 _____
Farm Wage Labor	<input type="checkbox"/> 4 _____
Off-Farm Wage Labor	<input type="checkbox"/> 5 _____
Business	<input type="checkbox"/> 6 _____
Salaried Employment	<input type="checkbox"/> 7 _____
Remittances, Pensions	<input type="checkbox"/> 8 _____
Other	<input type="checkbox"/> 9 _____

If Other, please write that livelihood: \_\_\_\_\_

12. Do you own or rent:

	Own	Rent
Bicycle	<input type="checkbox"/> 1	
Motorcycle	<input type="checkbox"/> 2	
Car	<input type="checkbox"/> 3	
Tractor/Harvester	<input type="checkbox"/> 4	
Cell Phone	<input type="checkbox"/> 5	
Television	<input type="checkbox"/> 6	
Pakka House	<input type="checkbox"/> 7	<input type="checkbox"/> 9
Kacha House	<input type="checkbox"/> 8	<input type="checkbox"/> 10

13. If you have a cell-phone, how many people in your habitation have you put into your cell phone address book?

No One	<input type="checkbox"/> 0
Very Few	<input type="checkbox"/> 1
About Half	<input type="checkbox"/> 2
More Than Half	<input type="checkbox"/> 3
Almost Everyone	<input type="checkbox"/> 4

### SECTION III. COLLECTIVE ACTION

14. Please tell me whether in general you agree or disagree with the following statements:

Please check the most appropriate response A, B, C or D.

A = Agree Strongly

B = Agree Somewhat

C = Disagree Somewhat

D = Disagree Strongly

	A	B	C	D
1. Most people in this community are basically honest and can be trusted.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. People are always interested only in their own welfare.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. In this community, one has to be alert or someone is likely to take advantage of you.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I do not pay attention to the opinions of others in the community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Most people in this community are willing to help if you need it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I feel accepted as a member of this community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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7. If a mother in this village has an emergency and needs to leave her baby for the day, she will easily find someone in this village she can trust with her baby

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8. If someone loses a pig, goat or chicken he or she will easily find others in this village to help to seek and find it.

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9. If a neighbor in this village lends some money to another neighbor, it is very likely that the lender gets her money back

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15. Think about the people that live in this village. If you had a newly born baby, in how many houses would you be able to leave your baby and trust them in case you had to leave for the day because of an emergency?

- No One  0
- Very Few  1
- About Half  2
- More Than Half  3
- Almost Everyone  4

16. If you had to borrow a small amount of money for an emergency, from how many of your neighbors would you be able to get the money with no interest?

- No One  0
- Very Few  1
- About Half  2
- More Than Half  3
- Almost Everyone  4

17. How much influence do you think you and people like you can have in making this village a better place to live?

- A Lot  3
- Some  2
- Not Much  1
- None  0
- Don't Know/Unsure  -1

18. Suppose that 10 of your neighbors are invited to help in community activities. How many would show up?

\_\_\_\_\_ Neighbors

**Section IV. Land & Water use**

19. Last year, how much land did your household have and how was it watered:

	Acres
Land Owned	_____
Land Leased In	_____
Land Leased Out	_____
 Total Land That Can Be Cultivated	 _____
Tank Irrigated	_____
Bore Well Irrigated	_____
Open Well Irrigated	_____
Land Fallow	_____

20. Who owns the bore well that you use to irrigate your crops? (Check One)

My Household	<input type="checkbox"/> 1
Shared With Relatives	<input type="checkbox"/> 2
Shared with non-Relatives	<input type="checkbox"/> 3
Purchased Water	<input type="checkbox"/> 4

21. If you use water from an open well to irrigate your crops, who owns the open well? (Check One)

My Household	<input type="checkbox"/> 1
Shared With Relatives	<input type="checkbox"/> 2
Shared with non-Relatives	<input type="checkbox"/> 3
Purchased Water	<input type="checkbox"/> 4

22. What kind of crops did you grow last year?

Crops Grown	Total Area (acres)	Total Production (quintal)	Irrigation		
			Surface	Ground Water	Rain Only
<b>Kharif Season</b>					
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Rabi Season</b>					
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Summer Season				
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. How much did you pay last year?

Water Purchased                    \_\_\_\_\_  
System Maintenance                \_\_\_\_\_

24. Over the last ten years, do you think the water table

Has Fallen                     -1  
Is Unchanged                 0  
Has Risen                       1

25. What do you think should be done to improve the water table?

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26. Do you have some final remarks on the groundwater exercise? You can write them here:

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## 9. Community Debriefing Protocol

The debriefing session will be held immediately following the conclusion of the Experiment sessions. By holding two simultaneous sessions, Men and Women groups, followed by the Community Debriefing, hopefully it will be possible to include all or most of the experiment participants in the debriefing with the experience and lessons fresh on everyone's minds. If it is necessary to schedule the Debriefing at a different time, it should be set for a time recent enough to the experiment for the participants to have fresh memory of the experience. The Debriefing is open to the entire community; ensure during the scheduling and setup for the field visit that the local contacts in the community advertise clearly that everyone from the community is welcome to join this session.

Open the session, explaining that the staff will not reveal the actions taken by any individuals in the games, but during the debriefing, the participants are free to share or keep private their own actions in the game, they are free to share what they are comfortable sharing.

There are several main points each debriefing session should cover in all communities, but beyond these general points, allow the community to drive the discussion. Allow the session to go where it needs to for the community.

1. Tell everyone: This is a fun activity to create dialog between them, academics and policy makers about a subject that they all care about. We use games because we want to understand how people make decisions. [With villages where we give cash payments: We use money because we want to study the decision-making process with real consequence for their pockets, just like in reality.]
2. Give a brief presentation about the game. Most debriefing participants won't be familiar with the game, so explain the game, similar to how the game was presented during the experiment. (We should be able to reuse the posters used for the games: Water/Payoff for Crop A vs. B; Results planting AAAAA vs. BBBBB).
2. Show the decisions that will lead to the most earnings (AAAAA) and the effect on available water, and the decisions that will lead to the least earnings (BBBBB) and its effect on water level. DON'T: use any language that implies one is worse or wrong. We DO NOT judge one option against the other; just describe the effects neutrally. (Reuse the poster that shows the difference between Planting AAAAA vs BBBBB.)
3. Show the results of the games, describe the general averages (NO SPECIFIC ABOUT INDIVIDUAL PARTICIPANTS). If a whiteboard is available, the general averages could be drawn as lines or bars on a picture. Alternatively, it may be easier to print a large poster to point at the different levels. Show the amount of Crop A and Crop B planted, on average, by each group. State how much each group earned.
4. Begin open discussion with community. Ask them questions to jump-start the discussion, but let the community members to talk freely, particularly the game participants:

- What happened during the first game (first 10 rounds)? What do you think was happening? What were you thinking?
- What did you talk about during the discussion between games?
- What happened during the second game?
- Was there a difference; why do you think that happened? Were you surprised by anything that happened? Why or why not?
- Was there a difference between the groups? If so, why was there a difference?
- "What did you think about when making your decisions?"
- Does this game relate to your situation? What are differences that you think are important?
- Are there different kinds of crops that you have to choose between that require different amounts of water? How do you decide which to grow? What is important to you when you decide what crops to plant?
- Are groundwater levels falling, rising, or steady in this community? (refer to the groundwater records of the watershed committee, if available)
- Do you think that groundwater levels are a problem? Do you think it will be a problem in the future?
- Does what you do affect water available for others (or does what others are doing affect the water you have available?)
- Does the game give you any ideas about your situation? Do you have any suggestions?

## **DOS & DONTs**

- **DO:** Get the community's trust that you will not show anyone the individual data, their decisions. The Facilitator is responsible for collecting all the experiment forms and storing them securely in a backpack. Make a fuss in the community discussion that all the forms are safe in your backpack and no one can look at it.
- **DO:** Allow participants to discuss and share their thoughts and opinions. The debriefing must be a comfortable environment for the community--those who participated in the games AND those who did not--to talk freely about the games.
- **DO:** Balance the community discussion between the "loud and extroverted" talkers and the shy, quiet members. Make sure no one is monopolizing the truth.
- **DONT:** Reveal how any individual acted in the game. Do not show any individual results.
- **DONT:** Tell the community that we are expecting/hoping to see them change their water-use because of the game. We are watching and learning from them.
- **DONT:** Tell the community that we are continuing to measure their water in order to test the effects of the games.
- **DONT:** Tell them what they **SHOULD DO** or **MUST DO**. **DONT** tell them how they should play the game to make more money or save water. They must come up with their own ideas and suggestions, if they feel like it. We record what they say and the ideas that they come up with.

## Appendix 2. Supplemental Statistics

**Table A2.1 Study Locations Summary Statistics**

Treatment	Watershed Number	Panchayat Number	Vill. No.	No. of Houses	Agri-land (Acres)	No. of Bore wells	NGO	Years in Program
A	1	1	1	193	1250	15	FES	6
A	1	1	2	14	95	4	FES	6
C	1	1	3	30	220	6	FES	6
B	1	1	4	33	165	1	FES	6
A	2	1	5	33	100	2	FES	6
B	2	1	6	31	48	0	FES	6
B	2	1	7	100	210	9	FES	6
C	2	1	8	64	110	10	FES	6
C	2	1	9	28	250	4	FES	6
A	2	1	10	19	250	5	FES	6
C	3	1	11	66	640	6	FES	6
B	3	1	12	107	896	67	FES	6
B	4	2	13	114	560	9	FES	6
A	4	2	14	30	125	4	FES	6
C	4	2	15	52	25	0	FES	6
A	4	2	16	250	550	16	FES	6
C	5	3	17	68	70	13	JJ	20
B	5	3	18	95	80	10	JJ	20
A	5	3	19	27	120	19	JJ	20
B	5	3	20	22	70	14	JJ	20
C	6	4	21	82	125	14	JJ	19
B	6	4	22	54	30	6	JJ	19
C	6	4	23	54	24	4	JJ	20
A	6	4	24	43	32	9	JJ	19
A	6	4	25	65	22	5	JJ	20
C	7	4	26	92	130	11	JJ	19
A	7	4	27	61	92	11	JJ	20
B	7	4	28	94	140	14	JJ	19

Treatments: A = Individual Payments, B = Flat Fee, C = Control

**Table A2.2 Summary Statistics**

<b>Variable</b>	<b>Observations<sup>1</sup></b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Water use	3100	1.664	0.950	0	3
Years in program	3400	11.588	6.688	6	20
Communication	3400	1.502	0.500	1	2
Available water	3100	33.287	9.960	16	50
Female	3400	0.498	0.500	0	1
Age	3380	38.500	12.872	20	86
Caste	3380	3.224	0.870	1	4
Education	3380	2.024	1.511	0	6
Household size	3360	4.805	2.126	2	12
Area owned	3380	2.105	1.396	0	10
Area tank- irrigated	3240	0.131	0.267	0	1.6
Area groundwater irrigated	3400	0.630	0.618	0	4

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<sup>1</sup> Observations refer to number of participants times number of decisions.

**Table A2.3 Caste Distribution of Sample**

<b>Caste</b>	<b>Percent</b>
ST	6.51
SC	9.47
OBC	39.05
OC	44.97
Total	100.00

**Table A2.4 Number of rounds played in the games.**

<b>Game Length</b>	<b>Number of Games.</b>	<b>Percent</b>	<b>Cumulative</b>
4	1	1.47	1.47
5	2	2.94	4.41
6	1	1.47	5.88
7	6	8.82	14.71
8	8	11.76	26.47
9	6	8.82	35.29
10	44	64.71	100.00
Total	68	100.00	