

APPENDIX 1. THE EXPERIMENT INSTRUCTIONS¹

Instructions for General Game

Overview

Welcome to the experiment. You are about to participate in an experiment related to the economics of decision-making. If you follow the instructions carefully and make correct decisions, you may earn a considerable amount of points. These points will help you to win a monetary prize at the end of fifteen rounds and qualify to win a grand prize at the end of the session. We encourage you to ask questions to the experimenter during this time, but refrain from discussing your decisions with other participants.

On the desk you should have a pen and several record sheets. At the beginning of the experiment each participant will be assigned a random ID number consisting of three numbers (for example, 101 or 329) that will be used as a subject identifier. This number will not give you any advantages in the experiment. Please, write this ID number at the top of your record sheets, in the space provided. Please, do not write your name.

The experiment will consist of a total of 15 rounds. Before you make any choice, the experimenter will randomly announce a number between 0 and 10 that represents a percentage of additional water (1=10%, 2=20% and so on) available for irrigation purposes for the members of the group. After the additional stock is determined in each round, we will ask you to select a number between 0 and 10 by writing it on your record sheet. The choice of this number represents the amount of the water you will use in this round. After all players have made their choices, the experimenter will calculate your “points”. If the session has not yet ended, you will continue onto the next round, where you will once again be asked to make a choice of a number between 0 and 10.

Sequence of the game in each round

The experimenter will randomly announce a number between 0 and 10 that will represent a percentage of additional available water (1=10%, 2=20% and so on). There is also a permanent stock of water that remains in each round. The sum of permanent and additional stock equals the total available stock.

After the additional stock is announced in each round, the experimenter will ask you to make a choice of water usage by writing a number between 0 and 10. The choice of this number represents your water use in this round. Please, record your choice on the record sheet in the space next to the round number. You will be making decisions simultaneously with the group of participants in this room. The decisions made by you and the other participants in this room will determine the amount of points you earn, and your decisions determine the amount of points they earn. Please, wait patiently and quietly for other players to finalize their choices.

Once all players have entered their choice and recorded them, the experimenter will collect record sheets from all players and return the sheets to you once the points have been calculated. The points for the round will be recorded under the column with the heading “Score”.

¹ The instructions were provided to the participants in Uzbek language and they were translated to English by Andrey Zaikin.

This number represents an amount of points that will determine whether you win a monetary prize at the end of the round. The prizes are described below.

How points are determined

Points in every round of this game depend on your action and the group choices. The points you earn at each round are given by:

$$U(x_i) = \left(\frac{x_i}{X}\right) [23X - 0.25X^2] + 5(W_r + R \times W_p - X)$$

which consists of two parts. The first part of the payoff function represents the benefits accruing to the player in each particular round depending on other players' actions. In each round you select the number between 0 and 10 denoted as x_i in equation (1). X represents the sum of all numbers selected by all players in the round.

The second part is related to the stock use where $W_r=50$ is the amount of permanent stock that is constant, W_p is the maximum amount of additional stock and R is the percent of additional stock available at the particular round (number randomly announced by the experimenter, reflecting the precipitation level where $R \in [0,1]$). This part turns into a disutility if a group of players overuses the total available stock, i.e., $50 + R \times 50 < X$, or in benefits if the group of players underuses the total available stock for a particular round, i.e., $50 + R \times 50 > X$.

How you are receiving points and winning prizes

In today's session we will play three 15-rounds. You can win monetary prizes after each 15 rounds if you are the player with the highest amount of points. You will record information for each new set of 15 rounds on a separate record sheet, beginning with round one. Notice that each record sheet has room for recording information on just 15 rounds of play. The score from this round will be also added to your total score.

At the end of the session, we will ask you to sum up points from all your three sets of 15 rounds (the experimenter can assist you in this task!). Record the total points on your receipt and you can win the grand monetary prize if you are the player with the highest amount of total points.

DO YOU HAVE ANY QUESTIONS BEFORE WE START OUR GAME?

Additional Instructions for Penalty Game

The main change in this game is that the player who selects the highest number will now be penalized. His points for the round will be reduced by a certain amount. The penalty is determined as a difference in payoffs of the two individuals who choose the highest and lowest numbers. In particular, the payoff of the player selecting the highest number, \bar{x} , is given by,

$$U_i^P(\bar{x}) = \frac{\bar{x}}{X} [23X - 0.25X^2] + 5(50 + R \times 50 - X) - [U_i(\bar{x}) - U_j(\underline{x})]$$

where the last term represents the penalty for the player who selects the highest number. If you select the highest amount, \bar{x} , then your payoff will be reduced by an amount $[U_i(\bar{x}) - U_j(\underline{x})]$ where $U_i(\bar{x})$ represents your points earned in this round without considering the penalty and $U_j(\underline{x})$ is the points earned by the player who chose the lowest number.

Additional Instructions for Bonus Game

We are now in this game considering the case where the player who selects the lowest number is awarded a bonus. His points for the round will be increased by certain amount. The bonus is determined as a difference in payoffs of the two individuals who choose the highest and lowest numbers. Specifically, the payoff of the player selecting the lowest number, \underline{x} , is given by,

$$U_i^B(\underline{x}) = \frac{\underline{x}}{X} [23X - 0.25X^2] + 5(50 + R \times 50 - X) + [U_j(\bar{x}) - U_i(\underline{x})]$$

where the last term represents the bonus for the player who selects the lowest number. If you select the lowest amount, \underline{x} , then your payoff will be increased by an amount of $[U_j(\bar{x}) - U_i(\underline{x})]$ where $U_i(\underline{x})$ is your points earned in this round without considering the bonus and $U_j(\bar{x})$ is the points earned by the player who chose the highest number.

APPENDIX 2. THE SURVEY QUESTIONNAIRE

Dear farmer,

We have determined that you are one of the farmers who uses irrigation water. As a result, you have been selected for this study that is conducted in the format of a game. We would like to ask you to answer the following questions.

The purpose of this study is to investigate the behavior of farmers with respect to water use and irrigation practices. In the end, this information will be used to make suggestions about how to improve the region's water using methods.

We need your help to make this research a success.

NUMBER: _____

QUESTIONNAIRE

1. What is your age? _____ Years

2. What is your gender?
 - Male
 - Female

3. What is your education level?
 - High School
 - Bachelor's degree
 - Master's degree
 - Ph.D.

4. How long have you been working in agriculture sector? _____ Years

5. What is the size of your family? _____ people

6. What is the size of your farm? _____

7. Please, list the crops which are grown on your farm?
 - _____
 - _____
 - _____
 - _____

8. What is the crop distribution relation to the total size of the farm?
 - _____%
 - _____%
 - _____%
 - _____%

9. What is your yield for crops you grow?
 - _____
 - _____
 - _____
 - _____

10. What is your source of water?

- a ditch or channel that is controlled by either a Water Users Association (WUA) or the regional water agency
- a ditch or channel that is shared and jointly controlled by yourself and one or more other farmers
- your own pumps that are lifting water from a well or other sources
- Others. Specify _____

11. Where is your farm located on irrigation channel?

- At the beginning
- In the middle
- At the end

12. Does your location on the irrigation channel affect the yield of your crops?

- Yes
- No

13. What are the most important problems that you face in irrigating your fields?

- _____
- _____
- _____
- _____

14. Do you usually get water on your irrigating land in necessary volume?

- Yes
- No

15. Do you know how much water will you get before planting seeds?

- Yes
- No

16. Do you know how much water your neighbors need?

- Yes
- No

17. Do you know how much water your neighbors will receive from WUA?

- Yes
- No

18. What kind of information do you know about your neighbors:

- Land size planted
- Crops planted
- Water needed
- Water received

19. Do you usually get water on your irrigation land on time?

- Yes
- No

20. Do you have any conflicts with your neighbors related to water?

- Yes
- No

21. Do you have any conflicts with Water Users Associations (WUA) related water distribution?

- Yes
- No

22. Do you participate in meetings of Water Users Associations (WUA) related water distribution?

- Yes
- No

23. What is the mechanism for water distribution?

24. Are there any penalties for in Water Users Association (WUA) bylaws (charter)?

- Yes
- No

25. Does WUA penalize water users for cheating or overusing water?

- Yes
- No

26. If yes, what kind of penalization?

- Reduction in water supply next period
- Monetary fines
- Others _____

27. Would you get involved in any illegal activities in order to obtain necessary amount of water?

- Yes
- No

28. If yes, which activities would it be?

- _____
- _____
- _____

29. Is there any bonus mechanism for not cheating or water saving techniques that you are aware of?

- Yes
- No

30. How much is the WUA fee? _____

Thank you very much for your cooperation in completing this questionnaire. If there is anything else that you would like to tell us about this experiment, please feel free to tell or to write the space below.