

**Dwelling near the Ditch:
A Game on Urban Waste and Flooding**
*Designed for the Red Cross / Red Crescent Climate Centre
by Pablo Coll and Pablo Milrud¹*

I. INTRODUCTION

We live in communities where individual preferences and collective choices do not always align. In the context of disaster preparedness, this can often result in difficult trade-offs between actions that can result in short-term gain for individuals and collective action that may be costlier but may also offer long-term protection for a group.

This participatory activity, *Dwelling in the Ditch* aims to support learning and dialogue about the opportunities and trade-offs faced within communities that lack effective waste collection services, and the additional stress that climate change (in the form of more frequent flooding) can pose for these communities. Players can choose to invest in the short-term in waste management services; or, they can choose to dispose of their waste in the drainage canal near their homes (“the ditch”), heightening risk of more intense flooding due to clogged drains, and experiencing related health problems caused by flooding and waste mismanagement over the long-term. As the game is played, players experience the tensions and trade-offs that may arise between:

- Individual and collective decision-making;
- Decisions made today vs. the decisions that can be made tomorrow;
- Decisions made today in the context of incomplete information.

A range of players including community members living in flood-prone slums and humanitarian organizations that aim to help them manage changing risks can play this game. As players confront these challenges, rich opportunities for learning and dialogue between different stakeholders emerge. The game is freely available for not-for-profit use.

II. GAME MATERIALS (5-100+ PLAYERS)

30 white chips per player, each represents \$1

8 black chips per player, each represents a household waste bag

Dice:

2 white dice for each group of 5 players, which will determine the local rains.

1 colored die per group, representing a regional forecast for that community;

1 *climate change die* per group: a regular six-sided die modified to show new values (two 1s, two 2s and two 3s)

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Game boards depicting local drainage channels, one per community.

III. GAME SETUP

The game is played in groups (communities) of five players each.

Each player begins with 30 white chips and 8 black chips

Each community begins with one game board, 2 white dice, and 1 colored die

IV. RULES OF PLAY & FACILITATOR GUIDANCE

The game consists of eight rounds.

There will be two winners:

- a. The player with the highest amount of white chips receives an *individual* prize.
- b. The group (community) with the highest amount of white chips receives a *group* prize.

INTRODUCING THE GAME

At the start of each round, players must decide whether to dispose one of their waste bags in the ditch (at no cost) or to invest in waste management services that will come and remove the bag safely and responsibly. If a player chooses to invest in waste management services, there is an up front cost of 1 chip (\$1). Floods can strike during this game and exacerbate the problems of waste mismanagement.

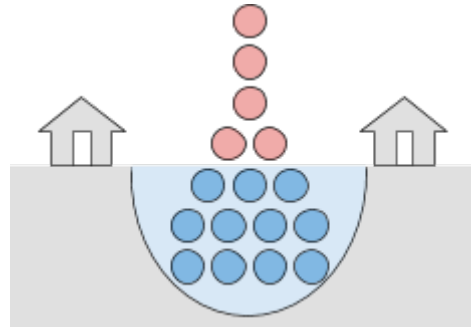
How are the rains determined? The roll of the three dice will determine whether each community experiences a flood or not.

- The colored die, which represents the regional forecast, is thrown first.
- The two local rainfall dice are thrown second.

Floods strike when the sum of the three dice adds up to 15 or more.

For communities that do experience flooding, players that *have not* chosen to invest in waste management services must pay 5 white chips (equivalent of \$5). This is the cost of recovering from the flooding and the health problems caused by waste mismanagement. Those players that *have* chosen to invest in waste management services but do experience flooding, must not pay for recovery as they have chosen to manage their waste responsibly.

The board depicts the three levels of the ditch; the ditch will begin to fill with waste bags as players choose to dump their bags in the ditch (each dumped bag is represented by a circle). The more bags that players dump into the ditch, the more quickly the ditch will fill up.



As each level of the ditch ‘fills’ up with disposed waste bags, the likelihood of flooding by 1:

One completed level (4 bags): Floods occur when the sum of the three dice adds up to 14 or more.

Two completed levels (4+4 bags): Floods occur when the sum of the three dice adds up to 13 or more.

And so on...

If the third level of the waste ditch becomes full, there is a sanitary risk for the local population. In such case, every player loses one white chip (\$1) per round so long as the situation continues.

Note to Facilitator:

Players make decisions individually and simultaneously.

The facilitator will ask players to decide whether to invest in WSM and countdown from 5 to 1. At the end of the countdown:

Players that choose to invest in WSM must secretly take a white chip in their hand, and then extend their closed hand over the game board.

Players that choose to dispose the waste bag in the nearby canal must extend a closed hand with nothing in it.

At the end of the countdown, the facilitator asks players to “Reveal their decisions” and open their hands.

Everybody opens their hands, showing their decisions:

- *a white chip*: the player pays the chip and the facilitator collects one black chip.
- *no chip*: the player pays nothing, and one waste bag goes to the ditch.

(NB: This “secret and simultaneous” mechanism is to be used in every decision made by the players throughout the game)

V. PRACTICE ROUND

Players are invited to first play a **Practice Round**.

1. Regional rainfall die is rolled

2. Players decide to either throw the waste bag into the ditch or invest in waste management services (WSM). Place a white chip in hand if they are choosing to invest in responsible waste management services. The Facilitator states the countdown 5...4..3...2...1...STOP! Players open their palms and reveal their choices. The facilitator collects the white chips of those that have invested.
3. Local rainfall dice are rolled
4. Players calculate the sum of the dice and determine - flooding or not?
5. Players resolve consequences: those that did not invest in WSM must pay 5. Players that did invest in WSM do not pay anything.

The game is played in eight rounds, each round represents one day in the players’ lives.

VI. PLAYING THE GAME

After the practice round, the Facilitator should invite players to begin to play the game ‘For Real’.

Starting at Round 4, the facilitator introduces an option for Waste Removal.

Community members now have the option of collaborating to remove waste bags out of the ditch. Each player decides individually whether or not to collaborate. The cost of collaboration is \$1. *All players must declare their decision at the same time.*

The "efficiency" and a community’s collective effort is determined as follows:

Participating people	Bags Removed
0	0
1	0
2	1
3	2
4	3
5	4

The number of bags removed from the ditch is equivalent to the number of players collaborating in the collective waste removal scheme minus one. If nobody collaborates, no bags are removed from the ditch.

The game follows the same order as before with this additional step (#3).

1. Regional rainfall die is rolled
2. Players decide to either throw the waste bag into the ditch or invest in **waste management services** (WSM). Place a white chip in hand if they are choosing to invest in responsible waste management services. The Facilitator states the countdown 5...4..3...2...1...STOP! Players open their palms and reveal their preferences.
3. Players now decide whether they invest in **collective action for waste removal**. Players that place a white chip in hand indicate they are investing in collective action. The Facilitator announces the countdown “5...4..3...2...1...STOP!” Players open their palms and reveal their preferences. The facilitator collects the chips of those that have invested. The corresponding number of waste bags are removed from the ditch, depending on the number of players that invested in collective action.
4. Local rainfall dice are rolled
5. Players calculate the sum of the dice and determine - flooding or not?
6. Players resolve consequences: those that did not invest in WSM must pay 5. Players that did invest in WSM do not pay anything.

Starting at Round 6, the facilitator introduces Climate Change into the game.

The Facilitator now replaces the colored regional rainfall die of each group with the *climate change die*. The likelihood of flooding is still determined by the sum of the three dice and the number of completed ditch lines remains the same.

The game is played until Round 8, after which winners are determined and awarded prizes by the Facilitator.

VII. NOTES ON POST-GAMEPLAY DEBRIEF

The costly environmental and health consequences of dumping waste bags in nearby ditches, as well as the benefits and trade offs of individual and collective action to improve waste management revealed during this game. During post-game debrief, the facilitator should elicit feedback and opinions on several topics. What were the perceived differences across strategies to protect the environment and reduce flooding risk over the short, medium and long-term? Were people more prone to act individually or collectively? How do people see trends in the disaster events, and how does this relate to some of the real life decisions and consequences that occur when dealing with responsible waste management?

Then, the facilitator can turn the game debrief to a discussion of the decision making processes during the game and how these relate to real life. What opportunities and consequences are not captured in the game? What can be done before waste builds up and/or flooding occurs to prevent related consequences?

VIII. FLEXIBLE GAME DESIGN: CREATING NEW, MODIFIED VERSIONS

This game can be played with many more than 20 participants. If there are more than 20 people, the facilitator should create additional teams and ensure sufficient materials are in place.

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