

Tragedy of the Commons Simulation (lab report)

Tragedy of the Commons Simulation

Introduction:

The purpose of this simulation is to explore how resources are used and exploited when they are available to multiple parties. The "tragedy of the commons" is the situation in which individuals use a common resource for their own personal gain and degradation of the commons results, leading to a decrease in yield for both the group and the individual. During the simulation, all data and notes should be included in your lab notebook.

Materials:

Goldfish crackers

Plastic spoons (fishing tackle)

Bowls (to be ponds)

Procedure:

Part I:

Divide yourselves into groups of four. Imagine this scenario. Each person represents the head of a starving family which requires food (strong motivation to acquire food). The only food source for these four families is a small fishing hole which can accommodate 16 fish. Fortunately, after each round of fishing by the four family heads, each remaining fish is able to spontaneously reproduce and make one new fish (i.e. 4 fish become 8, to a maximum of 16). Each person is allowed to take as many or few fish as you want, but if you take only one fish, your family will starve.

In this simulation, our pond is a bowl, and our fish are goldfish. Fish are caught using plastic spoons. Each fishing round will last for 1 minute. You should rotate your fishing order every round so that everyone has a chance to go first. At the end of every round, the number of remaining goldfish will be doubled to simulate reproduction. The simulation will continue for several rounds.

Part II:

This part is exactly like the first, except that in this simulation, everyone has a private pond in addition to the common pond. The private ponds can only hold 4 fish although all other rules apply. You may catch as many fish as you would like from both ponds during each round.

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Results:

1. Listen to the instructions provided by the instructor.
2. Run through four rounds of the simulation.
3. All data should be recorded in your lab notebook.

Part I: Commons pond

Round #	Initial # of fish	# of fish taken by fisher1	# of fish taken by fisher 2	# of fish taken by fisher 3	# of fish taken by fisher 4	Total left at the end of the round

4. Repeat the simulation, incorporating both the common and private ponds into your strategy.
5. All data should be recorded in your lab notebook.

Part II: Commons pond

Round #	Initial # of fish	# of fish taken by fisher1	# of fish taken by fisher 2	# of fish taken by fisher 3	# of fish taken by fisher 4	Total left at the end of the round

Part II: Private pond

Round #	# of fish at the start of round	# of fish taken this round	# of fish left at the end of the round

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6. Calculate:

- * The total number of fish caught by each person
- * The total amount of fish that could have been taken from the pond over the trial if the fish had been managed perfectly.
- * Your "management score" = What percent of the total possible amount of fish that could be caught by all fishers, were actually caught?

Your results section should include data tables and the answers to the above questions.

Analysis:

Discuss your results in paragraph form, and make sure that you address the following questions:

- What happened to the common resource in Part I? Why?
- Did you get different results for the pond in Part II? Why?
- Explain the rationale for your fishing technique.
- If you cooperated with other fishers, what was the result of that cooperation?
- Did you use different fishing strategies in the common pond and the private pond?
- Why does common usage lead to exploitation?
- What would be the ideal way to manage the common pond?
- How does the number of fish received by each fisher compare to the maximum possible for each?
- What are your management scores for each round and what are some ways that you could use to improve them?

Conclusion:

- Briefly summarize the results of this simulation and discuss the implications of this simulation on the management of common resources in the environment. What other resource management examples can you think of where this topic is relevant? Are these being used wisely? Why or why not? What can people do to use these resources most wisely?