

*Just wanted to note that I didn't actually participate in the activity but I assumed some of the consequences.

In the fishing simulation, our group quickly encountered the consequences of overfishing and the importance of resource management. Initially, our group overexploited the available fish population and depleted most of this population. With few fish remaining, our group realized that we had to change strategies. If everyone acted in their own interests, the fish population would go to Zero, so our group stopped fishing altogether to let them reproduce. Although some of us could've fished, it was in better interest not to fish as the reproduction rate is exponential. However, the entire group had to come together to reach this conclusion; in real life, this communal understanding is unlikely. The decision, naturally, is difficult. Each fisherman wants to fish as much as possible, similar to individuals/countries acting in their own interest. Short-term gains are hard to deny, and the mere fact that we are such incredibly efficient fishermen with huge ocean supplies leads to increased fishing. Personally, in the position of a fisherman, there is no real disadvantages to fishing more. As long as we have confidence in our ability to find fish, the ocean is so vast that overfishing (and subsequent minimal reproduction) is overlooked. On a singular fishermen level, it would have no tangible impact at all. Because the negative effects of overfishing take so long to trickle down to the singular fishermen level, a lot of the solutions to the Tragedy of the Commons must relate to governmental regulations. Governments are responsible for the masses—their populations. Their populations as a whole *do* feel these consequences much faster, so governments are inclined to implement widespread policies. These policies should explain to the fishermen the numerical trends of fishing, optimal solutions to combat said trends, and why everyone is needed to collectively reverse the changes. The last sentence is very optimistic with high operational costs of measuring fish and being proactive with fishermen communication, but it is possible. Also, emphasizing these policies/quotas for large-scale fishing operations would be a lot more effective than small-time fishermen. From a quantitative perspective, differences in the large-scale operations are far more pronounced than small discrepancies in individual fishermen. In conclusion, collaboration is key. While my solution is made for one country, international waters with multiple countries could unite under the same cooperative theory.

Regarding Garrett Hardin's Tragedy of the Commons assertion, I agree that when individuals use a common resource for personal gain without regulation, it inevitably leads to depletion and harm for everyone. Our fishing simulation demonstrated that unregulated exploitation resulted in the near collapse of the fish population, which reinforces this idea. Without collective responsibility, the resource will be overused to benefit individuals in the short term and lead to long-term scarcity consequences. However, here are some change we could make. To modify the simulation and make it more sustainable, we could do:

- (1) Establish fishing quotas to limit the number of fish each participant can catch per round, ensuring the population can replenish.
- (2) Implement restocking periods, where designated no-fishing seasons allow fish populations to recover before being harvested again.

(3) Encourage cooperative agreements, where participants share resources, set sustainable goals, and regulate fishing collectively, reducing overexploitation and ensuring long-term sustainability.

These solutions could apply to many industries beyond fishing, including the burning of fossil fuels, water supply, mining, lumber, and most limited natural resources. All of these industries deal with unchecked extraction and consumption contributing to resource depletion and future environmental degradation. Like fisheries, these resources require cooperative efforts to prevent their exhaustion.