Assignment 5 - Systems thinking gamelet

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# Purpose and insights obtained

Our game is designed to teach the players the concept of common pool resources and the tragedy of the commons. The tragedy of the commons is a common system dynamic archetype in which ...

Most people are familiar with the concept of the tragedy of the commons, but appear to not to directly recognize this when exposed to such a system. Since the management of common pool resources is essential for living on the planet in a sustainable manner, it is important that people learn to get more familiar with the archetype. Furthermore, the game introduces some manners of management of common pool resources and also shows how these can fail.

The main insights obtained from playing this game are that it is easy to overlook the tragedy of the commons when encountering it and that the management of common pool resources is impossible without surveillance.

# Plot

In order to reach the objectives set in the previous section, we want to place players in a system which shows the tragedy of the commons. Typical aspects of such a system are that there is a common pool resource, which can sustain itself within certain boundaries. Furthermore, players are incentivized to get as much as this common pool resource as possible in order to, for example, make profit. In order for a tragedy of the commons to occur, a minimum number of actors is needed in the system.

A common example of a system showing tragedy of the commons is a livestock of fish in a lake. Fishermen from the surrounding villages use this fish both for their own survival and for trade.

# Players and roles

Players in our game will embody fishermen from different villages around the lake and are told to make sure their families live a wealthy life by collecting as much fish as possible. The players are then elements of the system, not policy or decision makers.

Play testing has suggested that the minimum number of players for a tragedy of the commons to occur is four. In order to keep the physical version of the game manageable, the number of players is limited to a maximum of six players. A digital version could be played with many more players.

The game is not specifically designed to target stakeholders or experts in this domain. It is focused on ‘regular’ people, in order for them to get acquainted with the concept and to better recognize it as has been stated in the first section of this design document.

# Objective in game

The objective of the game is to reach the highest score without dying. A high score can be reached by collecting as much fish as possible. Each fish is equal to one point. A fisherman dies when in a round he has not caught at least two fishes. Dying has been added to the game to make sure that there is no winner when a tragedy of the commons occurs.

# Rules

The players sit around a box containing a number of fish. The players are told that they are fishermen from different villages and that they all want to make sure their families live a wealthy life by collecting as much fish as possible. Each fish they collect is worth a point and the person with the highest number of points wins. Furthermore, they are told they play a certain number of rounds. They may not communicate before or during the game in the first session.

The expected behaviour of the players is that in the first round they collect all the fish. However, since there are no more fish left in the system, they are unable to reproduce meaning that there will be no replenishment of fish in the next round. Therefore, the game then stops and all fishermen die.

The players will not know beforehand how many rounds they will play since then they can show strategic behaviour, letting all the fish live for each round but the last and then collecting them all.

After this first session a small debrief will be given in which the players will be explained that what they just experienced is called the tragedy of the commons. In the following round players will be given the opportunity to prevent a tragedy of the commons from occurring again, by beforehand making agreements with the other fishermen. This means they can communicate before the game, but not during the game.

Furthermore, instead of taking fish out of the bowl, they now have to write down how many they want to take and not share this information with the other players. They will then hand their piece of paper with how many fish they want to take out of the lake to the game master. The game master will then determine whether a tragedy of the commons occurred again or not by checking how much fish is left in the lake.

We expect some teams to be honest and make sure there are fish left to reproduce for the next rounds, however they will still take too many fish on average. When a player takes all fish and thereby disregards agreements made with other players, they will learn that you are dependent on the actions of others and the tragedy of the commons can still easily happen.

Apart from hearing their actual score at the end, the players will also be told what their maximum score could have been when they had let the fish reproduce.

The game can be further expanded by adding more rounds introducing more of the concepts regarding the management of Common Pool Resources as for example described by Ostrom[[1]](#footnote-1). However, due to the time constraints of this assignment these are not implemented.

# Representation of physical system

The game will be a physical game but could easily be implemented as a computer game. The concepts of the game are realistic but the world it is set in is fictitious.

# Representation of inter-actor environment

Communication is only allowed in the preparation of the second session, not during the game nor before or during the first session of the game. Communication will be done verbally and will be open.

1. Ostrom, Elinor (1990). *Governing the commons: the evolution of institutions for collective action.* Cambridge University Press [↑](#footnote-ref-1)