

Commentary for teachers

# Common pool resources

## Overview

### Topic and contents

This unit deals with the topic of the overuse of freely available resources, so-called common pool resources. Students play a game enabling them to recognise and experience first-hand the main incentives inherent in common pool resources. They get to discuss possible solutions as well as the difficulties involved in trying to implement them, and they try out the effect of penalties and conferences. The unit enables students to explore concepts such as the types of economic goods, the tragedy of the commons (and the associated concepts of the common pool resource dilemma or commons dilemma), externalities, sustainability, scarcity of resources, the role of the state and social norms. The topic can be – but does not have to be – linked to environmental problems (e.g. carbon emissions and climate change).

### Didactic format

The 'Fishpond' game is played with the whole class. Students work through the topic by way of the associated worksheet, which can be differentiated to suit the level of the class. A video projector is required. The masks worn by the players in the game can be ordered or downloaded.

### Time required

Two to four lessons, depending on the depth in which the topic is explored.

### Suitable subjects

Instruction in language, communication and society (LCS), economics and law (GYM), economics and social studies (KV), ecology/environmental studies, geography, history and civic studies, sociology and psychology.

### Level

Intermediate. The game can be used in a wide range of contexts. The level of difficulty can be increased more or less as desired in the evaluation.

### Resources accompanying the unit

The unit consists of this commentary for teachers and the following teaching material:

- ['Fishpond' game](#)
- [Tips on preparing and playing the game](#)
- [Slides for teachers](#)
- [Teacher evaluation – Web simulation](#)
- [Score sheet for players – Excel](#)
- [Score sheet for players – PDF](#)
- [Knowledge sheet](#)
- [Worksheet](#)
- [Sample answers for teachers](#)

## Competence-oriented learning goals

The students:

- are able to understand the properties and characteristics of common pool resources compared with other types of economic goods;
- are able to understand the causes and effects of the tragedy of the commons or commons dilemma;
- are familiar with and able to evaluate possible solutions to the tragedy of the commons;
- are able to reflect on their own behaviour in the context of a commons dilemma (i.e. examine their own actions and motives);
- can engage constructively with the behaviour of their fellow students in the context of a commons dilemma.

## Notes regarding this unit

### Economic background

Common pool resources are goods that no one can be excluded from using but where there is rivalry between the users. This tends to lead to overuse or over-exploitation, for example of fish stocks in public waters. For details, see the knowledge sheet for the unit. In the 'Common pool resources' unit, students in the role of fishermen make decisions about how much they want to fish from a fish pond. The declared goal is to catch as many fish as possible by the end. The rounds of the game are evaluated to show students how their individual actions ultimately affect fish stocks and stimulate discussion about the appropriateness of individual behaviour in economic, social and environmental terms.

Students are directly confronted with their own and their fellow students' behaviour, which they try to influence with penalties and conferences, both of which are options in the game. This is an opportunity for students to acquire both personal competences (examining their own actions and motives) and social competences (mutual examination of each other's behaviour). This rapidly raises questions such as: 'Is it okay to behave like that?', 'Is that morally reprehensible?', 'Why does the law prohibit a certain kind of behaviour?' and 'Who is ultimately justified in their behaviour?'. – This potentially forms the basis for a discussion in class about social norms (e.g. laws), ethical principles and individual values.

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▶ **Tragedy of the commons** Common pool resources are goods that no one can be excluded from using but where there is rivalry between the users. This tends to lead to overuse or over-exploitation, for example of fish stocks in public waters. For details, see the knowledge sheet for the unit.

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▶ **Common pool resources can work** As research by the renowned environmental economist Elinor Ostrom (1933–2012) – so far the only woman to be awarded a Nobel Prize in economics – has shown, in many cases common pool resources are managed more appropriately and sustainably than private or state-controlled goods.

Notable examples are alpine pastures such as the Urner Boden, where resources are owned by a local community (in this particular case the Corporation of Uri) and managed by the owners themselves in accordance with jointly agreed rules.

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### Fishpond

'Fishpond' is a game designed to give participants an intense emotional introduction to

the topic of common pool resources and form a basis on a shared experience. The common pool resource is represented by a fishpond. Over the course of several rounds, the students anonymously try to catch as many fish (i.e. get as many points) as possible. Each player can catch up to three fish per round. If they catch an average of no more than two fish per round, the fish population can recover sustainably between rounds.

This means that, theoretically, the players could go on catching fish for as long as they wanted. However, there is an incentive for each player as an individual to catch three fish per round. In most cases this results in overuse or even a collapse in fish stocks, which leaves everyone worse off. This situation enables the players to experience and understand first-hand the conflict between personal gain and acting in the interests of the group as a whole. It illustrates a classic case of the tragedy of the commons or commons dilemma. The teacher leads the game from a computer connected to a video projector.

To make sure that decisions remain anonymous, it is recommended for players to wear masks. These can be ordered at [www.iconomix.ch/order](http://www.iconomix.ch/order). The rules of the game and the different stages of each round are described in a [separate document](#) ('Fishpond explained').

The game can be augmented with two interesting options.

- Firstly, over the course of the game the teacher can introduce the possibility of penalties. This means that whoever catches three fish in any one round may receive penalty points, which are then deducted from their score. This can only happen if enough other players participate in an effort to punish them and are willing to give up one of their own points. While this will slow the depletion of the resource, the process can generally not be stopped altogether.
- Secondly, the teacher can call a class conference. In this case the students have three minutes to discuss and decide on rules of behaviour. After a conference it may be possible for the pond to be sustained for the entire duration of the game. Nevertheless, the outcome is still open because, just as in real life, not all players are likely to stick to the group's decisions.

Ideally the game should first be played without these additional options (using the teacher evaluation and the 'Without penalties' Excel tab), in which case it will probably last for only a few rounds. The game can then be played a second time, this time introducing the penalty option (using the teacher evaluation and the 'With penalties' Excel tab) and – if the fish population continues to decline – calling a class conference as well. This way the students get to experience both the depletion of fish stocks (in the first game) and the effect of penalties and a conference (in the second game).

An alternative, short version would be to play only once and introduce penalties over the course of the game (if fish stocks decline to two thirds of the original population; in this case use the teacher evaluation with 'Short version' Excel tab). A conference can also be called later on. In this case it is not necessary to play the game twice; on the other hand, it means it is not possible to compare how the game develops with and without the options.

Further tips for running the game:

- Some teachers find it hard to identify with the aim of the game. It is important to remember, however, that the aim of the game (to catch as many fish as possible) is distinct from the learning objective (to understand the commons dilemma/tragedy of the commons). The purpose of the game is to enable students to experience a problem that commonly occurs in the real world. For this reason it is not advisable to make the survival of the fishpond the goal of the game. While ensuring its survival would undoubtedly be preferable, this would only result in a tedious, dull

game, which would neither spark a learning process nor reflect what can be observed in reality (e.g. overfishing of the world's oceans). It is important to discuss the ethical issues, but it is advisable to leave this until after the game.

- To make the incentives realistic, the teacher can promise all students who score 5 or better (see scoring system) a small prize, and a big prize for those with 5.5 or better. In theory all the players should be able to win the small prize if they act sustainably and only ever take two fish. Given that there is no way for them to discuss and agree among themselves, however, this can prove difficult in practice. Whatever the case, the big prize is practically unobtainable if people are trying to achieve it. Their attempts to win the big prize will also ensure that no one wins the small prize either.
- The rules of the game should be explained very clearly – if possible with the help of the slides. For example, the teacher should explain that the aim is to catch 'as many fish as possible' rather than 'the most fish'. This subtle difference is key, because if stocks are rapidly depleted, no one will achieve the goal of catching as many fish as possible. In this case, even the players with the most fish will get an insufficient score.
- If the teacher believes the class can cope with a conference, this option is particularly recommended. A conference is most exciting if called when the situation is critical but not beyond recovery.

## Possible lesson plan

The material is designed to enable active problem-based learning (see [www.iconomix.ch/didactics](http://www.iconomix.ch/didactics)). The targeted skills can be developed in three phases:

### Phase 1: Engage with the material

The teacher starts directly by explaining the rules of the 'Fishpond' game – without any prior explanation of common pool resources – and has the class play the game once (the short version) or twice (only introducing penalties and a conference in the second round). The game creates a sense of concern, a shared experience, and throws up many different questions around the topic. It is crucial for students to precisely understand the problem and recognise it as a challenge. Only this way can they set clear goals for the subsequent phase of working through the problem.

### Phase 2: Discuss and reflect

The first part of the reflection phase involves making the experiences of the game phase explicit and naming them. **Section A of the Worksheet** (Exercises related to the game) can be used to work out the characteristics and implications of common pool resource systems:

- Students analyse their experiences from the game and note down general observations on the outcome and the emotions arising during the game.
- Students talk about fish stocks and the way they develop.
- They discuss the behaviour of the fishers.

The sample answers to the Worksheet are deliberately detailed, and serve as an aid to teachers. For theoretical input, there is the option of studying the **knowledge sheet** in class or as homework. Alternatively, the teacher can talk about the most important points from the knowledge sheet in a presentation. The text contains knowledge and technical terms around the topic, and the summary outlines the 'core knowledge' in compact form.

### Phase 3: Practise and apply

This phase is all about consolidation and transfer: students can reinforce the skills they have acquired through practice, expand their skills and become more agile by tackling more challenging tasks. The transfer tasks in **Section B of the Worksheet** (Further tasks) are available for this purpose.

## Overview of possible lesson plan

|   | Steps                     | Description   | Media/material  | Time          |
|---|---------------------------|---|---|---------------|
| <b>Phase 1</b><br>Engage with the material<br><br>25–45 minutes | Introduction              | Introduction to the 'Fishpond' game                                     | Slide set (rules, structure of the game, scoring system), score sheet for players, computer and video projector | 5–10 minutes  |
|   | Game                      | Run game (possibly once without and once with penalties and conference) | Masks, teacher evaluation (or check sheet slide), score sheet for players, computer and video projector         | 15–30 minutes |
|   | Scoring and results       | Game scores, possibly giving out prizes                                 | Teacher evaluation (or 'Fishpond explained' slides and scoring system), computer and video projector, prizes    | 5 minutes     |
| <b>Phase 2</b><br>Discuss and reflect<br><br>40–65 minutes      | Evaluation and reflection | Evaluating game using exercises 1 to 3 on the Worksheet                 | Slide set (slide 7), Worksheet (Section A: Exercises related to the game), sample answers                       | 30–45 minutes |
|   | Theory                    | Study knowledge sheet (possibly as homework) or teacher presentation    | Knowledge sheet   | 10–20 minutes |
| <b>Phase 3</b><br>Practise and apply<br><br>30–45 minutes       | Transfer tasks            | Complete transfer tasks in a pair or group                              | Worksheet (Section B: Further tasks), sample answers  | 30–45 minutes |