UNIT 4
CONFLICT
Upper secondary level

The fishing conflict
How can we solve
the sustainability dilemma?

4.1 The fishing game (1)

4.2 The fishing game (2)

4.3 How do we catch "as many fish as possible"?

Debriefing and reflection

4.4 How can we achieve sustainability?

Ways to balance goals and overcome conflict

Unit 4
Conflict
The fishing conflict
How can we solve the sustainability dilemma?

Introduction for teachers

1. What this unit is about

This unit focuses on the problem of how to manage common resources. If political decision makers, companies and citizens fail to solve problems of this type, they may lead to serious conflict and even to war.

To illustrate the issue, imagine the following everyday situation: in a cinema, full of visitors, a small person cannot see much because a giant 1.90 metres tall happens to be sitting in front of him. So the small person stands up. But now other visitors have a blocked view, so they stand up too. In the end, everyone in the cinema is standing. No one can see better than before, and what is more, standing is more uncomfortable than sitting. In fact, now the situation is even more unfair than before, as small people can't see anything.

This example has a lot in common with the "big" resource management problems, for example overfishing. Such problems are difficult to solve because they have two dimensions, as the cinema example shows:

1. What rule do the visitors in the cinema need to guarantee everyone a good view?

   (The issue.)

2. In what way can this rule be enforced if someone in the cinema breaks it?

   (The institutional dimension.)

Besides overfishing, examples of "big" resource management problems are global warming, disposal of nuclear waste, and overconsumption of groundwater supplies. Many players with competing interests are involved (the issue dimension). On a global level, there is no super-state that can enforce a rule on a sovereign state (the institutional dimension). But the pressure of problems like global warming and climate change is mounting, and therefore political leaders and citizens around the world must make an effort to find a solution.

The fishing game addresses the problem of overfishing, focusing on the issue of sustainability, the first dimension of the problem. The task would become too complex for the students if it also included the institutional dimension; however, it is possible address the institutional dimension by extending and linking the fishing game to unit 5. See the introduction to unit 5 for further information on this option.

2. The fishing game

The fishing game is the key task in this unit, adopting a task-based learning approach. The students face a problem and must find a solution – under time pressure – as they often must in reality. The students reflect on their experiences in lessons 3 and 4.

In the fishing game, the students face the problem of how to manage a common resource. The fishing game is designed around a scenario that seems to be quite simple. The students form four groups

and act as four crews of fishermen living in villages around a lake. The fish stock in the lake is the fishermen's common resource, and their only source of income. The students will immediately become aware that their common interest is to avoid overfishing their fish stock.

However, there are no rules in place, nor are there any institutions such as a fishermen's community council where the players could communicate and discuss the problem. Nor do the fishermen have any idea how many fish they can catch without damaging the reproduction of the fish stocks. The students have the task to identify all these problems, and to take action.

The teacher manages the game. Before the game starts, the players receive the deliberately ambiguous instruction, "Catch as many fish as you can." The players can read this instruction in two ways:

- "As an individual team, maximise your income." (Short-term profit maximisation.)
- "As a community, make sure that you catch as many fish as you can in the long run." (Long-term sustainability.)

Experience has shown that the students usually adopt the goal of short-term profit maximisation. Some groups catch less, and soon discover that they are not only poorer, but that they cannot save the fish stocks by an unco-ordinated effort. A scenario rapidly unfolds in which the fish stocks are in danger of being exhausted, and a gap between rich and poor villages develops. The players may have strong feelings, as the game first produces winners and losers, before the community as a whole slips into poverty.

The students face a daunting challenge:

- They must make a joint effort to solve the problems.
- They must begin to communicate.
- They must collect information on the reproduction of the fish stocks and devise a scheme for sustainable fishing.
- They will discover that they need an institutional framework to make sure that everyone follows the rules that they have agreed on to save the fish stocks.
- Finally they must agree on a rule on how to distribute the catches fairly.

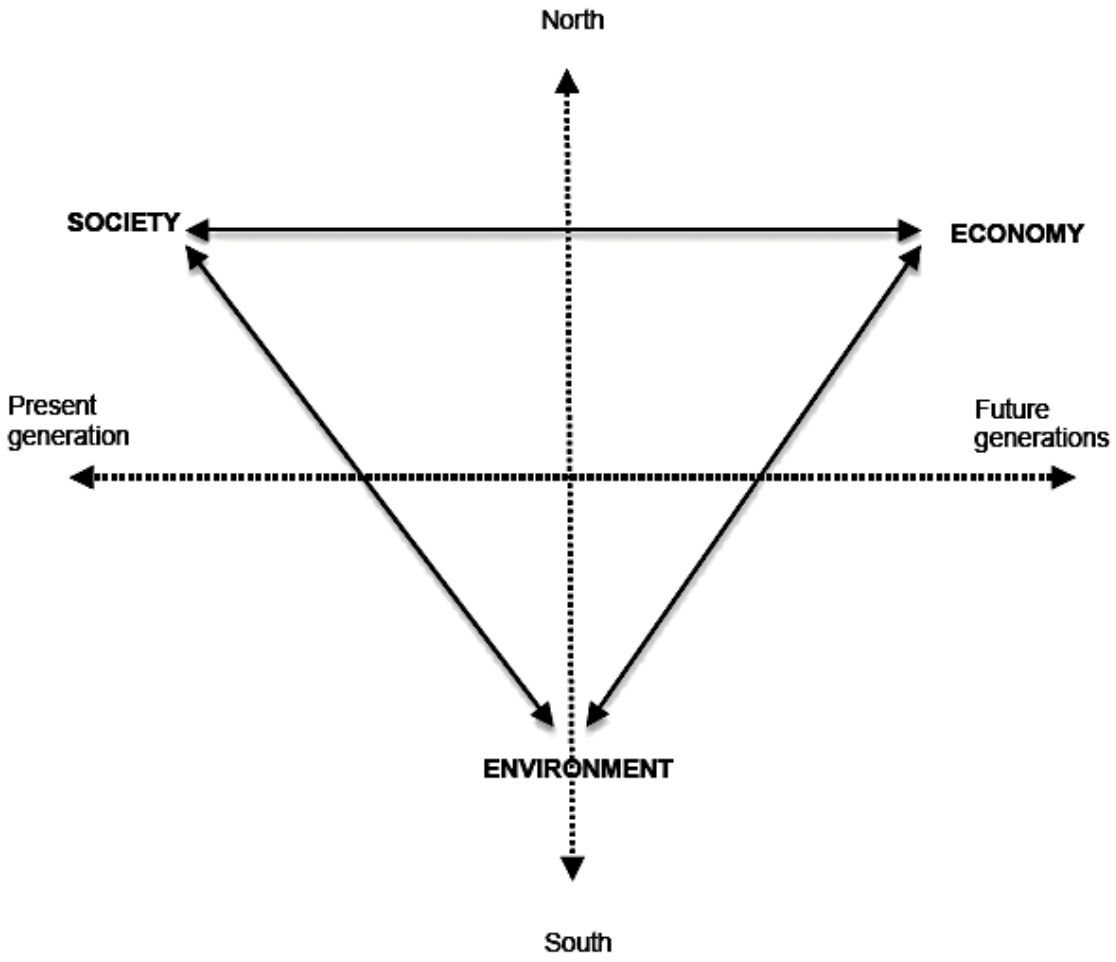
The fishing game, as simple as its design may seem, takes the students to the heart of some of the global issues of the 21st century, and it offers them experience of what politics is about – solving urgent problems that endanger a community, or even mankind.

3. Reflection

The students may succeed in solving some of the problems they are involved in, or they may fail. It is important that in the reflection phase, the students understand that such a failure is nothing to be ashamed of. For one, failure is the more common outcome in reality than success, and second, the fishing game is not a school task, but stands for a complex political problem. No one knows the appropriate solution to a political problem beforehand; we must try to find one.

In the fishing game, the students have discovered a complex set of questions some of which can be linked to the model of sustainability (✍ student handout 4.2):

- What is the optimum level of fishing that is compatible with the reproduction of the fish stocks?
- How can we make sure that this balance of maximum output (goal of economic growth) and protection of the fish stocks (goal of environmental protection) works permanently, today and in future?
- What is a fair distribution of work effort and fishing output among the four villages in the community?



Sustainability model (✍ student handout 4.2)

The model of sustainability includes all three questions. They stand for the three basic goals of economic growth, environmental protection, and distributive justice in society; they are linked to the two dimensions of time (the interests of the present and future generations), and space (the global dimension – north and south).

The model of sustainability describes both the dilemmas that emerge if a player attempts to achieve only one goal, for example profit at the expense of resource protection, and a balance of goals in a successful strategy of sustainability. ✍ Student handout 4.3 guides the students to reflect on the implications of "catching as many fish as possible" from these two perspectives – the goal of temporary profit gains for one player, and from the perspective of a sustainability balance.

Within the game setting, an optimum solution is possible and can be defined in figures; the teacher can supply this solution (✍ student handout 4.4) to support the students if necessary.

This analysis will prompt the students to raise the question of why achieving sustainable development on a larger scale is so difficult, and what the individual citizen can do to support this goal.

Options for extending the unit

1. Linking units 4 and 5

As already mentioned above, the students can explore the question of what institutional framework serves the fishermen's needs best. This can be a framework of rules, and a body of state authority to enforce it, or a mutual agreement between equals. The students can continue the fishing game and apply their institution as a tool, thereby putting it to the test.

2. Research task

It is obvious that the fishing game stands for political issues ranging from those in the local community to those at the global level. As mentioned above, CO_2 emissions, overfishing, nuclear waste disposal, and overconsumption of groundwater supplies are examples of such issues.

A study of one of these, or other issues, is possible both in an extension in class, or as a research project. In this case, the students are given a lesson to report on their findings, and perhaps discuss further steps to be taken.

The key concept of conflict

All of us have experienced conflict, and for most of us it is unpleasant. In pluralist societies the differences between people with different interests and values tend to increase, which increases the potential for conflict.

Political communities face the challenge of finding ways of dealing with conflict. Democracy is a system that attempts to civilise conflict. It delivers a framework in which to act out conflict not though violence, but through the spoken word. The exchange of arguments and a clear articulation of different interests is even useful, as it gives a clear picture of the needs and interests that the different groups in society have and which should be considered when making decisions.

In pluralist societies with a democratic constitution, conflicts are usually settled by compromise. This works best if the conflict is about the distribution of a scarce resource, e.g. income, time, water, etc. Conflicts that focus on ideology – different values, religious beliefs, etc. are more difficult to settle by compromise; here some mode of peaceful co-existence must be found. Conflicts that centre on identity – colour, ethnic origin – cannot be settled, but need to be contained by a "strong state".

Potential for conflict is present wherever and whenever people interact with each other. In EDC/HRE, the students may learn to understand conflict as something "normal" that they need not be afraid of. Indeed they must possess the skills to handle conflict through negotiation and responsibility – the willingness to consider the perspectives and interests of others, and to protect the rights of all to participate in peaceful conflict resolution. This manual can therefore be read as a series of training sets for skills in conflict resolution. Taking part in democracy means taking part in settling conflict.

Competence development: links to other units in this volume

What this table shows

The title of this manual, *Taking part in democracy*, focuses on the competences of the active citizen in democracy. This matrix shows the potential for synergy effects between the units in this manual. The matrix shows what competences are developed in unit 4 (the shaded row in the table). The strongly framed column shows the competences of political decision making and action – strongly framed because of their close links to taking part in democracy. The rows below indicate links to other units in this manual: what competences are developed in these units that support the students in unit 4?

How this matrix can be used

Teachers can use this matrix as a tool for planning their EDC/HRE classes in different ways.

- This matrix helps teachers who have only a few lessons to devote to EDC/HRE: a teacher can select only this unit and omit the others, as he/she knows that some key competences are also developed, to a certain extent, in this unit – for example, taking responsibility, problem analysis, negotiation skills.
- The matrix helps teachers make use of the synergy effects that help the students to be trained in important competences repeatedly, in different contexts that are linked in many ways. In this case the teacher selects and combines several units.

Units	Dimensions of competence development			
	Political analysis and judgment	Methods and skills	Taking part in democracy Political decision making and action	Attitudes and values
4 Conflict	Conflict and dilemma analysis Interdependence Sustainability	Identifying complex problems Negotiating	Compromising Co-ordination of policies	Willingness to compromise Responsibility
2 Responsibility	Dilemma analysis	Considering consequences of choices		Mutual recognition
3 Diversity and pluralism	Conflict potential in pluralist societies	Negotiating		
5 Rules and law	"Rules are tools" to handle conflict	Problem analysis and solution	Designing and applying an institutional framework of rules to resolve conflict	
6 Government and politics	Politics – a process of problem and conflict resolution	Description and analysis of political decision-making processes	Participating in public debates on decision making	

7 Equality	Conflict between majority and minority groups		Designing means balancing group interests	Adopting the perspective of others
8 Liberty	The spoken word – the medium for civilised conflict resolution	Arguing	Strategies of argument	"Voltairian spirit": appreciation of freedom of thought and expression for all

UNIT 4: Conflict – The fishing conflict
How can we solve the sustainability dilemma?

Lesson topic	Competence training/learning objectives	Student tasks	Materials and resources	Method
Lesson 1 The fishing game (1)	Analysing a complex situation, making decisions under time pressure. The students become aware of dilemmas involved in maintaining sustainability.	The students identify problems and develop solutions and strategies.	Materials for teachers 4.1-4.4. Pocket calculator or computer. Slips of paper (width A4), markers.	Task-based learning.
Lesson 2 The fishing game (2)	Negotiating a compromise. Interdependence, conflict of interests.	The students analyse a complex problem. The students (should) co-operate to develop a joint solution.	The same as in lesson 1.	Task-based learning.
Lesson 3 How do we catch "as many fish as possible"?	Analytical thinking: linking experience to an abstract concept or model. Model of sustainability goals.	The students reflect on their experience in the fishing game.	Student handout 4.2. Student handout 4.3 (optional).	Debriefing statements. Plenary discussion. Individual work.
Lesson 4 How can we achieve sustainability?	Analysis and judgment: Reflecting on experience through concept-based analysis. Incentives strongly influence our behaviour. The effect of incentives can be checked by rules (externally) or by responsibility (self-control).	The students apply concepts to their personal experience.	Student handout 4.2.	Presentations. Plenary discussion. Teacher inputs.

Lesson 1
The fishing game (1)

This matrix sums up the information a teacher needs to plan and deliver the lesson. **Competence training** refers directly to EDC/HRE. The **learning objective** indicates what students know and understand. The **student task(s)**, together with the **method**, form the core element of the learning process. The **materials** checklist supports lesson preparation. The **time budget** gives a rough guideline for the teacher's time management.		
Competence training	Analysing a complex situation, making decisions under time pressure.	
Learning objective	The students become aware of dilemmas involved in maintaining sustainability.	
Student tasks	The students identify problems and develop solutions and strategies.	
Materials and resources	Materials for teachers 4.1–4.4: 4.1 Copies of record sheets for groups. 4.2 Reproduction chart of fish population (for teacher). 4.3 Record chart (flipchart, blackboard or transparency). 4.4 Record diagram (flipchart, blackboard or transparency). Pocket calculator or computer. Slips of paper (width A4), markers.	
Method	Task-based learning.	
Time budget	1. Introduction to the fishing game.	10 min
	2. Fishing game (three rounds).	30 min

Information box

If conditions allow, lessons 1 and 2 should be combined. But the game may also be played in two separate rounds.

In the beginning, the students are neither encouraged to communicate with each other, nor does the teacher intervene when they do so – except by insisting on the time frame.

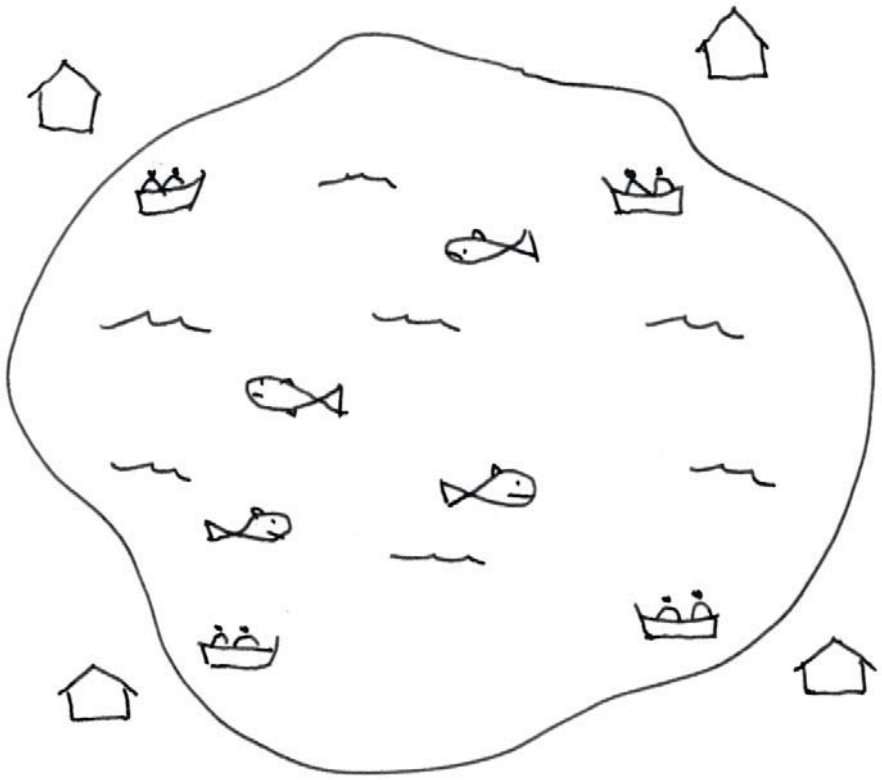
Lesson description

Stage 1: Introduction to the fishing game

The teacher explains to the class that they will play a game that will simulate an important part of real life.

“Imagine that you are members of one of the four village communities living on the shore of the lake. There is plenty of fish in the lake, so you need not worry what to live on. Fishing is the only branch of the economy; you have no other source of income.”

The teacher may illustrate this introduction by a simple drawing on the board or flipchart, showing the lake, some fish, and the four fishing villages, each with a boat setting out from the shore.



“You go fishing throughout the season, but there is a close season in winter and spring to allow the fish population to recover. In these months, you must live on your supplies of dried fish and repair your boats and nets to be ready for the next season.”

The students then receive the instructions on how to play the fishing game.

They form four groups of not more than six students per group. (If there are more than four groups, it is necessary to adapt the chart of results – see materials for teachers 4.3).

Each group acts as a team of fishermen. They are encouraged to give their boat a fancy name, and are given a record sheet to note down their catches.

The game is played in rounds that represent fishing seasons and close seasons during which the fish population recovers.

The teacher uses just one phrase to define the goal of the game, “Try to catch as many fish as possible.” This instruction may be understood in different ways, but the teacher does not give any further hints, and leaves it to the students to decide on their fishing policy. In lesson 3, the students will come back to this starting point.

At the beginning of the season, each group decides on the quota of fish that it wishes to catch. The maximum quota of fish is 15% per boat. As the fishing population at the beginning of the first season amounts to 140 tons, this means that the maximum catch per group is 21 tons. (Again, the limit per group must be adapted if more than four groups are taking part.)

The teacher gives no extra information on what will happen if each of the four groups goes to the limit and their total catch per group amounts to 84 tons. This is already part of the game: the students realise how little they know. They neither know what path their competitors will choose, nor do they know the reproduction rate of the fish population. If they wish, they can find out by themselves.

Stage 2: Fishing game

The first round begins. The groups discuss what quota to choose. After four minutes the teacher asks for the record sheets from the groups. He/she enters their quotas in the record chart, works out the tons caught by each boat and the total quota and catch in this first season (a pocket calculator or computer proves useful here). He/she enters the results in the chart and presents them to the students. The development of the fish stocks and total catches is depicted in a diagram based on materials for teachers 4.4.

By referring to the growth table, he/she also tells the students what the total fish population is at the beginning of the second season.

The students are handed back their record sheets and work out their total catch over the seasons.

Experience has shown that students usually tend to go to the limits at the beginning of the game, so a total catch of 70 tons – half the fish population – is quite likely; it may be even higher. If the fish population has been depleted by half, it will recover to reach a new level of 94 tons. This means that the fish population has dropped by a third within one year. The curves on the diagram point sharply downwards and depict the imminent danger of a total exhaustion of the fish stock.

The students will now become aware of this threat. If they all make full use of the maximum quota of 15%, the fish will be near to extinction in two or three seasons. The groups will discuss whether they should reduce their quotas to prevent total extinction. From this point on, every game develops differently, depending, for example, on age and gender.

The following rounds are played in the same way. During the next three rounds, the groups are not encouraged to communicate, but they may do so if they take the initiative. The teacher, as the manager of the game, gives the students some time, but insists on playing the next round after about 5 minutes; this depicts reality – when the season begins, the fishermen must do their job.

After a few rounds, the teacher may perform a “miracle” if the catches have diminished too fast, by adding some extra tons to the figure given in the growth table.

After the fourth round, the teacher encourages the groups to communicate if they have not yet done so.

Sometimes they will reach a joint decision, and sometimes they won’t. The groups decide whether and to what extent they wish to be bound by common agreements – as in real life.

Lesson 2
The fishing game (2)

This matrix sums up the information a teacher needs to plan and deliver the lesson. **Competence training** refers directly to EDC/HRE. The **learning objective** indicates what students know and understand. The **student task(s)**, together with the **method**, form the core element of the learning process. The **materials** checklist supports lesson preparation. The **time budget** gives a rough guideline for the teacher's time management.		
Competence training	Negotiating a compromise.	
Learning objective	Interdependence, conflict of interests.	
Student tasks	The students analyse a complex problem. The students (should) co-operate to develop a joint solution.	
Materials and resources	The same as in lesson 1.	
Method	Task-based learning.	
Time budget	1. Fishing game (round 4).	7 min
	2. Negotiations.	15 min
	3. Fishing game (rounds 5-7).	20 min

Information box

The students continue with the fishing game, playing a further three or four rounds.

After round 4, the teacher encourages students to talk to each other, if they have not yet done so. The time budget is halted, to give the students an opportunity to exchange their views and suggestions. The teacher decides how long this period is before the students continue.

Lesson description

Stage 1: The students play one round

The teacher presents the results. If the students take the initiative, the teacher lets them go ahead and gives them some time. The teacher announces that the interval between the fishing seasons has been extended by 10 minutes.

Stage 2: Negotiations

The students face a serious problem – overfishing – and they have no institutional framework (rules of communication, system of fishing rules and controls, etc.) to support them unless they create it.

The teacher should not participate in the students' discussions in any way (advisor, commentator, chairperson, coach, etc.), but watches and listens carefully. The learning opportunities in the task-based approach lie in the problems and, as in life outside school, the students must cope alone.

Stage 3: The students play three final rounds

The teacher calls the students to continue the game at its normal pace. Depending on the outcome of the negotiations, the players may change their fishing policy, and the results show some success in averting the collapse of the fish stock.

Lesson 3
How do we catch "as many fish as possible"?
Debriefing and reflection

This matrix sums up the information a teacher needs to plan and deliver the lesson. **Competence training** refers directly to EDC/HRE. The **learning objective** indicates what students know and understand. The **student task(s)**, together with the **method**, form the core element of the learning process. The **materials** checklist supports lesson preparation. The **time budget** gives a rough guideline for the teacher's time management.		
Competence training	Analytical thinking: linking experience to an abstract concept or model.	
Learning objective	Model of sustainability goals.	
Student tasks	The students reflect on their experience in the fishing game.	
Materials and resources	✍ Student handout 4.2. ✍ Student handout 4.3 (optional).	
Method	Debriefing statements. Plenary discussion. Individual work.	
Time budget	1. Debriefing: the students step out of their roles.	15 min
	2. The students explore the ambiguity in the instruction, "Try to catch as many fish as possible".	10 min
	3. The model of sustainability goals.	15 min

Information box

Debriefing: students step out of their roles. Strong feelings may be involved here.

Inductive approach to the model of sustainability goals: students develop goal categories of the sustainability model out of their debriefing statements. Exercise in abstract thinking.

Constructivist learning: students create the context in which they understand and need the sustainability model. Rather than asking the teacher, they ask the questions in reflection time.

Lesson description

Stage 1: Debriefing

The students step out of their roles in the fishing game

The teacher makes notes on the flipchart or blackboard, leaving space for a second column.

The students may be expected to express strong feelings:

- Conflict between winners and losers.
- Rich and poor fishermen.
- Destruction of natural resources.
- Decline of total fishing output (impoverishment of the whole fishing community).
- Difficult negotiations, e.g. lack of responsibility, some partners unwilling to co-operate.
- Difficult to obtain vital information. Guessing added to overfishing.
- No authority to enforce rules.
- No reward for responsible fishing policy – fishing less means poverty, and additional catches for the other fishermen.

Stage 2: Reflection

The students explore the ambiguity in the instruction, "Try to catch as many fish as possible"

The teacher explains that the students have outlined a complicated problem. To overcome such problems, the first step is to understand them. As in medicine, the doctor needs a diagnosis before he/she can decide what kind of therapy to apply.

The teacher reminds the students of the instruction they received before they began the fishing game and writes the phrase on the blackboard or flipchart: "Try to catch as many fish as possible".

The teacher asks the students to recall how they understood this instruction and what their goal was when they defined their fishing quota. They should think about three points:

"Try" – who should try?

"As many as possible" – what is the limit indicated by the word "possible"?

They spend a minute in silence. The teacher then asks for their inputs. The students explain how they understood this instruction, and give their reasons. When a clear picture has emerged, the teacher takes down the key statements on the blackboard (flipchart).

If the students report back that they adopted the perspective of their village, focusing on their interests, if necessary at the expense of others and of the environment, the result would be as in the following table. But perhaps some students include other perspectives, and the result would come closer to the full picture (see second table).

<table>
<tr><td colspan="6">Our goal in the fishing game:
"Try to catch as many fish as possible."</td></tr>
<tr><td colspan="2">Who?</td><td colspan="2">As many as possible?</td><td colspan="2">When?</td></tr>
<tr><td rowspan="2">Our boat</td><td rowspan="2"></td><td colspan="2">Limit set</td><td rowspan="2">Today</td><td rowspan="2"></td></tr>
<tr><td>by quota</td><td></td></tr>
<tr><td>Welfare for us</td><td></td><td>Welfare for us</td><td></td><td>Welfare for us</td><td></td></tr>
</table>

If they have kept to the perspective of increasing their village's welfare, the result will be striking. The students will see that by their narrow focus on "welfare for us *alone*" they have collectively brought about the catastrophe.

This gives rise to the question whether the students can imagine any alternative, more constructive readings of the goal "catch as many fish as you can".

On the other hand, if the students also include other goals, such as protection of fish resources or responsibility for the other villages in the lake community, the contrast between the goal definitions becomes immediately apparent.

The students may also check whether the initial instruction should be changed. However, if they agree to the model assumption that fish in the lake are the only protein resource available, they will accept it.

In the end, by whatever path the discussion has taken, the students should have recognised and acknowledged that "catching as many fish as possible" can be defined in different ways, entailing different consequences.

The teacher sums up the students' inputs and adds them to the board:

<table>
<tr><td colspan="6">Our goal in the fishing game:
"Try to catch as many fish as possible."</td></tr>
<tr><td colspan="2">Who?</td><td colspan="2">As many as possible?</td><td colspan="2">When?</td></tr>
<tr><td rowspan="2">Our boat</td><td rowspan="2">All of us</td><td colspan="2">Limit set</td><td rowspan="2">Today</td><td rowspan="2">In the long run</td></tr>
<tr><td>by quota</td><td>By reproduction rate</td></tr>
<tr><td>Welfare for us</td><td>Welfare for all</td><td>Welfare for us</td><td>Protection of resources</td><td>Welfare for us</td><td>Responsibility (environment, future generations)</td></tr>
<tr><td>Conflict</td><td>Peace</td><td>Conflict</td><td>Peace</td><td>Conflict</td><td>Peace</td></tr>
</table>

This picture may prompt the students to raise new questions.

Clearly, the alternatives are much more sensible than insisting on "welfare for us" at the expense of all, as the outcome will be conflict. But why didn't we, the players, attempt to balance these objectives from the start, and why was it so difficult to agree on these goals in the negotiations?

Stage 3: The model of sustainability goals

Step 3.1: The students link their discussion to the model

The teacher distributes ✍ student handout 4.2 (Model of sustainability goals). The students are given the task of identifying the goal in the model that they have just discussed ("welfare for us" – "welfare for all" – "protection of the environment" – "responsibility for future generations").

The students respond after a brief period of silent study. They will identify the goals in the triangle on the handout, and, depending on their preceding discussion, further goals.

The teacher refers to the explanatory notes (the meaning of the double pointed arrows, dimensions of the goals: sustainability goals, time dimension, global dimension).

Step 3.2: Setting the homework task: the students prepare an input for the following lesson

The teacher sets the students a piece of homework. They are to prepare an input, to be delivered at the beginning of the following lesson. They receive the following instructions as a mini-handout (see 🗐 materials for teachers 4.5).

> 1. Explain why it is difficult to achieve two or more sustainability goals at the same time. Refer to ✍ student handout 4.2 and our discussion in class.
>
> 2. Explain why most players stick to the goal of individual welfare, even when the disastrous consequences have become clear.
>
> If you wish, you can also refer to concrete examples.
>
> Have your statements ready in writing.

The teacher has the option of supplying ✍ student handout 4.3 to support the students if necessary.

Lesson 4
How can we achieve sustainability?
Ways to balance goals and overcome conflict

This matrix sums up the information a teacher needs to plan and deliver the lesson.

Competence training refers directly to EDC/HRE.

The **learning objective** indicates what students know and understand.

The **student task(s)**, together with the **method**, form the core element of the learning process.

The **materials** checklist supports lesson preparation.

The **time budget** gives a rough guideline for the teacher's time management.

Competence training	Analysis and judgment: Reflecting on experience through concept-based analysis.	
Learning objective	Incentives strongly influence our behaviour. The effect of incentives can be checked by rules (externally) or by responsibility (self-control). Concepts: incentive, dilemma.	
Student tasks	The students apply concepts to their personal experience.	
Materials and resources	✍ Student handout 4.2.	
Method	Presentations; plenary discussion; teacher inputs.	
Time budget	1. The students give their inputs.	10 min
	2. The students reflect on the influence of incentives on their behaviour.	15 min
	3. The students discuss two basic approaches to solve the sustainability–profit dilemma.	15 min

Information box

In this lesson, the students apply the concept of incentives to analyse their behaviour in the fishing game. The game setting encouraged the students to focus on the goal of maximising their short-term gains regardless of the consequences for other fishermen or the common fish resource.

In this concluding lesson, the students discuss ways of controlling incentives that have counter-productive effects. This can be done in two ways. First, by political means (authoritative approach); rules and laws allow or forbid certain types of behaviour. Rewards and punishment are means of enforcement. Second, the individuals control their behaviour themselves through taking responsibility. The students discuss which approach they prefer.

The homework task is important in several respects: students reflect on and record the result of the preceding lesson. They take the floor at the beginning of this lesson, and are actively involved from the start. The teacher receives feedback on what the students have learnt and understood. This gives him/her a guideline on how to continue (constructivist learning and student-centred instruction).

Lesson description

Stage 1: The students give their inputs

The teacher links the lesson topic to the key questions

The students are expected to arrive at the lesson with their statements on two key questions. By thinking about these questions, the students have created the conceptual framework for the whole lesson (constructivist learning).

1. Explain why it is difficult to achieve two or more sustainability goals at the same time. Refer to ✍ student handout 4.2 and our discussion in class.

2. Explain why most players stick to the goal of individual welfare, even when the disastrous consequences have become clear.

If you wish, you can also refer to concrete examples.

Have your statements ready in writing.

The teacher announces the topic of the lesson: how can we achieve sustainability? He/she writes it on the blackboard or flipchart, and gives the floor to the students. Each of the two questions is dealt with in turn.

Question 1: Sustainability goals

The students may be expected to have thought about the following problem: while goals of sustainability harmonise with each other, some are mutually exclusive. Protection of the environment, for example, goes together very well with responsibility for future generations and for mankind as a whole (global perspective, one world). These goals are endangered if the present generation strives for increasing welfare today (economy). Society (the goal of fair distribution) and economy (the increase of output and productivity) may harmonise, but in many cases do not.

The fishing game was a worst-case scenario in which everything went wrong. Even the richer fishing villages faced economic decline.

The students may refer to current efforts to harmonise economic growth and protection of the environment: recycling of waste, production of electricity by wind, sun or water generators, or the development of cars driven by electricity.

Question 2: The goal of individual welfare

The students may be expected to have thought about the following problem: in the fishing game, the "winner" seemed to be the village with the biggest catches. Responsibility for the environment did not pay, in a very literal sense.

In each round, the teacher gives the floor to 6 to 10 students. When a clear picture emerges, the students attempt to sum up what they have heard. The result may come near to what has been outlined here, but may also differ. If the students disagree, this should also be stated.

Stage 2: The students reflect on the influence of incentives on their behaviour

In a brief input, the teacher introduces two concepts that help to understand how the students behaved in the fishing game.

In the fishing game, responsibility for the environment and for the well-being of the others did not pay, in a very literal sense, but maximising the catch to increase one's own welfare did. This signal was all too clear. This kind of subtle influence on us, prompting us to behave in a certain way, but not forcing us, is called an *incentive*.

Here, the teacher pauses and asks the students to think about incentives that they experience in their daily lives. We may expect examples like the following:

- We tend to buy the cheaper product if the quality is more or less the same.
- We make an effort in school to achieve good marks.
- Parents promise their children a treat if they do well at school.
- Insurances offer bonuses if their customers do not make a claim.
- You receive a gift if you subscribe to a magazine, or if you succeed in convincing your friend to subscribe.
- Some people do not want to get drunk because they fear their reputation will suffer.

The students, or the teacher, draw a conclusion from such examples.

These examples show very clearly that incentives appeal to our individual interests. Often they plainly and bluntly have to do with money, but also with our wish to be successful, or to be accepted by others. Competitive market economies strongly rely on incentives, and the profit incentive is at the core of free market competition. Therefore it is no surprise if the students respond to an incentive that is very familiar to them.

Stage 3: The students discuss two basic approaches to solving the sustainability–profit dilemma

The teacher adds a second prompt, linked to the concept of dilemma. The incentive to increase our individual gain is strong. From the perspective of sustainability the consequences are disastrous if we all respond to the profit incentive, and we know it. We are in a dilemma. We know we should do something to protect the common resources, but if we try, we will experience failure, and end up poorer than the others. So we return to our profit goal, fearing the worst. This situation, in which we do something seriously wrong no matter which option we choose – and we must choose one – is called a *dilemma*.

The students should first ask questions on comprehension. Once they agree to the thesis that the profit incentive in the initial phase of the fishing game is powerful, they may turn to the question of how to overcome its destructive potential. Their experience during the game is important here. Did the students succeed in controlling or co-ordinating their fishing policies? Even if they failed, what solutions were suggested? What solutions would they suggest looking back?

Broadly speaking, we may expect the students' ideas to fall into two categories. They may not address all the aspects included in this ideal-type description:

- *The authoritative approach*: the fishermen need a set of rules and laws, and a system of control and sanctions to enforce them. The fishermen are controlled by an institution standing above them, and this institution – a government, most probably – would also define the goals of sustainability. The liberty to follow profit incentives would be strictly limited.
- *The contract-based approach*: the fishermen sign a contract on rules or principles of conduct, and perhaps also on sustainability goals. They may also agree on a system of controls and sanctions.

Which of the two options do the students prefer? If little time is left, the teacher asks for a show of hands, and one or two students from each side give their reasons. If time allows, a discussion may follow. The students may point out that the weakness of the hierarchical, authoritative approach is that a remote institution may not have a clear understanding of the goals of sustainability. The local contract-based approach has its strengths in its expertise, but may be inferior in sanctioning breaches of the contract. As the fishermen are partners on equal terms, they can hardly police each other.

Materials for teachers 4.1
Fishing game: record sheet for players

Record sheet		
Boat No.	Name_____	
Season No.	Fishing quota (15% maximum)	Catch (in tons, total amount)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Record sheet		
Boat No.	Name_____	
Season No.	Fishing quota (15% maximum)	Catch (in tons, total amount)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Materials for teachers (game managers) 4.2
Reproduction chart: recovery of the fish population (in tons of fish)

- At the end of the fishing season 47 tons of fish are left in the lake.
- In the close season, the population of fish recovers. In this example, the fish population amounts to 56 tons at the beginning of the new fishing season.
- The game manager announces this figure to the players, who then decide on their catch in the new season.
- The game manager must not show this reproduction chart to the players.

End of old season	Beginning of new season	End of old season	Beginning of new season	End of old season	Beginning of new season	End of old season	Beginning of new season
tons	tons	tons	tons	tons	tons	tons	tons
0	0	38	43	76	103	114	147
1	0	39	45	77	104	115	147
2	1	40	46	78	106	116	147
3	1	41	47	79	107	117	147
4	2	42	49	80	109	118	147
5	2	43	50	81	110	119	147
6	3	44	52	82	112	120	148
7	4	45	53	83	113	121	148
8	5	46	55	84	115	122	148
9	7	*47	*56	85	116	123	148
10	11	48	58	86	118	124	148
11	12	49	59	87	119	125	149
12	13	50	61	88	121	126	149
13	14	51	62	89	122	127	149
14	15	52	64	90	124	128	149
15	16	53	65	91	126	129	149
16	17	54	67	92	128	130	150
17	18	55	69	93	130	131	150
18	20	56	71	94	132	132	150
19	21	57	73	95	134	133	150
20	22	58	75	96	136	134	150
21	23	59	76	97	138	135	150
22	24	60	78	98	140	136	150
23	25	61	79	99	141	137	150
24	27	62	81	100	142	138	150
25	28	63	82	101	142	139	150
26	29	64	84	102	142	140	150
27	30	65	85	103	143	141	150
28	31	66	87	104	143.	142	150
29	32	67	89	105	144	143	150
30	34	68	91	106	145	144	150
31	35	69	92	107	145	145	145
32	36	70	94	108	145	146	150
33	37	71	95	109	146	147	150
34	38	72	97	110	146	148	150
35	40	73	98	111	146	149	150
36	41	74	100	112	146	150	150
37	42	75	101	113	146		

* indicates the example used here – 47 tons (end of old season) – 56 tons (beginning of new season).
Based on: Wolfgang Ziefle, “Das Fischerspiel”, p. 13.

Materials for teachers 4.3
Fishing game: record chart

Season No.	Population of fish before season (tons)	Boat No. 1		Boat No. 2		Boat No. 3		Boat No. 4		Total quota %	Total catch (tons)	Population of fish after season (tons)
		Quota %	Catch (tons)	Quota %	Catch (tons)	Quota %	Catch (tons)	Quota %	Catch (tons)			
1	140											
2												
3												
4												
5												
6												
7												
8												
9												
10												

Materials for teachers 4.4
Fishing game: diagram of fish stocks and total catches

Tons										
160										
150										
140	x									
130										
120										
110										
100										
90										
80										
70										
60										
50										
40										
30										
20										
10										
0										
Season No.	1	2	3	4	5	6	7	8	9	10

Copy this diagram on to an overhead transparency, the blackboard or a flipchart. Record the development of the fish stocks (beginning of season) and total catches (end of season) by marking the tons of fish stocks and catches, and drawing two lines in different colours.

Materials for teachers 4.5
Homework instructions (mini-handout for students)

The students receive the following instructions for their homework. This page can be copied and cut into mini-handouts. A written instruction is more precise and saves time in class.

✂

1. Explain why it is difficult to achieve two or more sustainability goals at the same time. Refer to ✍ student handout 4.2 and our discussion in class.

2. Explain why most players stick to the goal of individual welfare, even when the disastrous consequences have become clear.

If you wish, you can also refer to concrete examples.

Have your statements ready in writing.

✂

1. Explain why it is difficult to achieve two or more sustainability goals at the same time. Refer to ✍ student handout 4.2 and our discussion in class.

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If you wish, you can also refer to concrete examples.

Have your statements ready in writing.

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If you wish, you can also refer to concrete examples.

Have your statements ready in writing.

Unit 4.5 Background information for teachers Reading list on the fishing game

Reading list

Garrett Hardin (1968), "The tragedy of the commons", in *Science*, Volume 162 (1968), p. 1244, www.garretthardinsociety.org.

Elinor Ostrom (1990), Governing the commons. *The evolution of institutions for collective action*. Cambridge University Press.

Wolfgang Ziefle (2000), "Fischerspiel und Verfassungsspiel. Die Allmendeklemme und mögliche Auswege", in: Gotthard Breit/Siegfried Schiele (eds.), *Werte in der politischen Bildung*, Wochenschau-Verlag, pp. 396-426, www.lpb-bw.de/publikationen/did_reihe/band22/ziefle.htm.

Wolfgang Ziefle (1995), "Das Fischerspiel", in: Landeszentrale für politische Bildung Baden-Württemberg (ed.), *Politik und Unterricht* (1/1995), pp. 7-35.