



With
accompanying
teaching
materials

ResourceRation

Instructions for Playing the Game

A project of



Supported by



 EIT RawMaterials is supported by the EIT,
a body of the European Union

In keeping with the motto “Playing aids understanding”, Resource Ration gives players the opportunity to grasp the complexity of the world using the topic of resources. Grouped into different generations, the participants purchase resources for the survival of their fictional businesses. In doing so, on an abstract level, they are able to choose between more or less sustainable options. Their decisions impact the consumption of the resources, which in turn has an impact on the players – and indeed on all generations. Which strategy advances their own company the most? And what happens when the shared resources become scarce?

Information about the Game

Target Group

The game is aimed at classes in their first or second year of secondary school, who are exploring the topics of resources, the environment and/or fairness. The exercise can be used when teaching subjects such as economics, the environment, ecology and social studies.

Number of People

The game is designed in a modular way on the basis of “generations”, meaning that, in principle, there is no upper limit to the number of players. The optimum number of participants is three to six per generation, with three to four generations in total. So the ideal number of participants is between 12 and 24, with a minimum of nine.

Duration

The time needed to complete the game is between 1.5 and three hours, depending on the length of the evaluation at the end. The topic of resources can be comprehensively covered using the complementary lesson materials in around eight 45-minute sessions.

Preparation for the game organiser: The better prepared the game organiser, the greater the meaning and clarity derived from playing the game and the more interesting the evaluation. We recommend that you plan at least three hours for preparation.

Additional Materials

The game was designed in such a way that the materials needed for playing can either be printed out or are already available in school or your immediate environment. We recommend choosing materials that are durable or printing them out in a way that ensures they can be used more than once. In addition to these instructions, to play the game you also need the materials listed on the next page. Below you will find tips and suggestions for the different materials.

- Various materials can serve as game tokens, providing they can be marked with symbols and colours (pebbles, PET bottle caps, magnets, dried beans, etc.).
- It is similarly possible to use a variety of materials as a visualisation of the available materials (large stones, wooden blocks, PET bottles or even something edible). When choosing the material, keep in mind that the bigger and more visible the resources, the clearer the depletion of the resource pool becomes. The simplest alternative is to hang coloured sheets of paper on a wall chart for each resource unit and to remove these as the corresponding resources are consumed. During the game, sustainable decisions generate new resources. These should not be available at the start, but should be kept in reserve by the game organiser.
- Playing mats, money, event cards and price booklets can be printed out using the templates provided.

Per generation (maximum of six participants):

Table with enough chairs

1 card detailing the most important rules of the game (can also be hung up just once in a visible place)

One printed playing mat

1 set of printed price discs in 3 colours

1 set of printed event cards (15 event cards)

1 opaque bag

6 resources

6 resources in reserve (coloured differently from the normal resources)

Money for the bank (12 x 1s, 12 x 5s and 12 x 10s)

18 post-it notes or other paper slips for keeping track of the game's progress for interim analyses

Per person:

91 currency units (6 x 1s, 7 x 5s and 5 x 10s)

10 personal tokens (marked with an individual symbol)

10 neutral tokens

One paper clip and set of choice cards for the anonymous rounds coloured in **pink / red**, **blue** and **green**.

Prize of your choosing:

It is advisable to present the participants with the prospect of a prize for the winner. This increases the appeal of winning and makes the dilemma between the individual and the common good more meaningful. Example prizes: A physical item with a sustainable background (resource-friendly products), vouchers, free time, etc.

Printing Templates

Attached to these playing instructions you will find printing templates for the following materials. The templates must be printed on one side only in each case.

Material	Number
Template: "Personal currency units"	Print one template per person
Template: "Bank currency units"	Print one template per generation
Template: "Price discs"	Print one template per generation
Template: "Event cards"	Print one template per generation
Template: "Choice card for anonymous rounds"	Print one template per 10 participants
Template: "Playing mat"	Print one template per generation on A3
Template: "List of the most important rules"	Print one template per generation on A3
Template "Instructions for moderation"	Print once

Contents of these Game Instructions

- Objectives and Requirements (Pages 6-7)
- Info Box “Core Principle of the Game – The Tragedy of the Commons” (Page 8)
- Preparation for the Game (Page 9)
- Game Objective and End of the Game (Page 10)
- Course of the Game (Pages 11-15)
- Evaluating the Game (Pages 16-18)
- Background Information about the Game (Page 19)



In each case, the info boxes will explain the significance of the various game elements and mechanisms to the real world in addition to their connection to the common-land dilemma. These explanations are intended solely for the game organiser and should only be revealed to the participants during the evaluation phase, if they have not already made the connection themselves.

The first info box “Core Principle of the Game – The Tragedy of the Commons” gives an overview of the principle of the commons dilemma and its depiction in the game.

Additional Lesson Material

Additional lesson materials dealing with the topic of resources are available on the project website for organising preparatory and follow-up work for the game.

Objectives and Requirements

Guiding Principle

Many of today's challenges facing the environment are united by an underlying principle – the tragedy of the commons (for a definition and detailed explanation, see the info box on the next but one page). The proposed game aims to make this principle, which encompasses the impacts of many individual decisions on resources held in common and the subsequent impacts on the community as a whole, more apparent and easy to grasp. This experience, and the understanding that it cultivates, is of crucial importance for solving many problems concerning the environment, justice and fairness. In addition, this understanding helps to answer questions such as “Why is the world the way that it is?” or “Why is it so difficult as a society to solve environmental problems if we already know so much about them?”, which are asked with increasing frequency by children at the target group age. Furthermore, it is important to understand that currently virtually all human activity requires resources that are provided to us by our planet in more or less finite quantities. This means that in virtually every aspect of our daily lives, we encounter the tragedy of the commons in one form or another. With the help of the supplementary interactive learning materials and through the explanations and examples experienced during the game, a light should be shone on these topics and situations, which in turn should be linked to solutions, either based on the literature or generated by the participants' creativity. In this way, the participants should later be able to spot the patterns that represent an unsustainable use of resources in their environment and recognise their own potential to act with regard to finding and implementing a more sustainable solution.

Learning Objectives

The participants...

Preparatory learning material	<ul style="list-style-type: none">...can explain what a resource is and differentiate between material and immaterial resources (S2)....can give three examples of their own day-to-day needs and describe the resources that are needed to fulfil them (S2)....can name three examples each of both finite and renewable resources and explain the difference between them (S1, S2)....can give three examples of resources that are in particularly short supply or have already been overexploited and can explain why they have been overexploited (S1, S2)....can give two examples of ecological processes that can be attributed to the use of resources and that are harmful to humanity (S1, S2)....can give two examples of resources whose use has a detrimental impact on the environment. They can explain why these resources become a problem for humanity if they are overexploited (S1, S2).
During the game	<ul style="list-style-type: none">...can derive from the game why the appeal of using non-sustainable resources currently prevails in our society (S4)....can derive three factors from the game that contribute to the overuse and/or unfair distribution of a resource (S4)....learn from playing the game that the overuse of resources has a negative impact on society and subsequent generations in particular (ecological, economic and social) and can explain this using examples (S2).

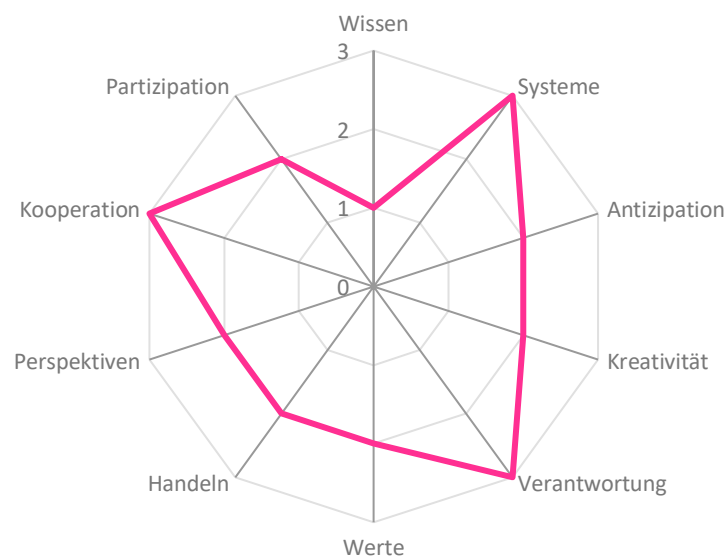
During the game	...learn from playing the game that through acting in a sustainable way as a community, all individuals in a society are better off and there are fewer inequalities, providing that all participants play along. They can explain this using examples (S2). ...can derive three factors from the game that can contribute to solving the dilemma between the individual desire to win and acting in a way that is sustainable within the community (S4).
Follow-up learning material	...can compare the pros and cons of the strategies presented for covering the needs of society without overexploiting resources (S4). ...assess the feasibility of these strategies and evaluate possible challenges to implementing them (S5). ...can create their own model for the sustainable use of resources within a company (S6). ...can plan actions they can take as an individual to contribute to the prudent use of resources on a daily basis (S6).

Skills (S) in Accordance with ESD

Where possible, these lesson materials were designed according to the guidelines of Education for Sustainable

Development (ESD). In the authors' opinion, the materials cover the ESD skills as follows. The focus of the materials and the educational game lies on teaching an understanding of the system and networked thinking, learning about individual responsibility and the influence of individual decisions on others, and practising cooperation.

Further information on ESD skills can be found here: www.education21.ch



Knowledge
Systems
Anticipation
Creativity
Responsibility
Values
Action
Perspectives
Cooperation
Participation



Core Principle of the Game – The Tragedy of the Commons

Through this game, a principle that is fundamental to many different environmental problems can be experienced first hand – “the tragedy of the commons”. The understanding cultivated by the game of how environmental problems come to be is a core foundation for developing different approaches and motivating individuals to find solutions to these problems.

The commons refers to a shared resource that is finite but may be freely used by all. The phrase “tragedy of the commons” or the “commons dilemma” is understood as an observation that humanity does not efficiently use freely available but finite resources, and this results in the overexploitation of common goods. Three examples of this are the overfishing of the oceans, the looting and pillaging of animal and plant populations (forest death) and the use of the atmosphere as a sink for atmospheric pollutants, resulting in air pollution. Measures for solving the commons dilemma must be introduced and consistently implemented by humans themselves, in other words by resource users or a higher authority. Such measures include regimentation or taxation mechanisms for certain activities (fishing quotas, zoning regulations, CO₂ tax) or local forms of regulation such as the building of cooperatives, in which users have a strong connection to the resources themselves and can recognise and prevent damaging resource-consuming practices.

In this experimental game, the commons dilemma is brought to life using an abstract example with abstract resources and abstract opportunities to take action. As members of a generation, the participants access limited shared resources (represented by blocks or something similar) that are needed to retain and expand their hypothetical businesses. In each round they must gain resources for their business, but they may adopt different approaches to achieving this goal:

- an **intensive** approach, meaning that resources are consumed **without** efforts to achieve efficient usage and are then removed from the system.
- an **efficient** approach, meaning that resources are consumed **with** efforts to achieve efficient usage and are then removed from the system.
- a **renewable** approach, in which resources are used within a **cycle** and thus remain in the system.

With the initial abundance of resources and the cost-effective option of intensive usage, at the beginning of the game, as in real life, there is an incentive to adopt an intensive approach. In the course of the game, the following generations begin to feel the effects of the non-sustainable behaviour of the previous generations, and conditions become increasingly difficult. Only through consultation within an inter-generational conference can the effects on society as a whole be seen and joint solutions for sustainable behaviour discussed. The outcome of the game can vary quite considerably. Perhaps a course correction can be made at the last minute and there may be enough resources left, but perhaps not and the game may end with the total depletion of the resources.

Info box: Core Principle of the Game – The Tragedy of the Commons

Preparation for the Game

Define the Number of Participants and Generations

Calculate the number of participants and assign these to different generations. The ideal number is three or more participants per generation, with three or four generations (so between nine and 24 participants). The game becomes most interesting when it is played with the highest possible number of generations.

Define the order in which the generations will take their turns. The game is set in the future, not in the past! Generations one, two, three and four represent the next four generations from today (e.g. parents – children – grandchildren – great grandchildren – ...). Make note of a brief descriptor for each generation. This should be kept hidden at the start. The participants should be unaware at the beginning that their groups represent different generations.

Hand Out the Materials

It is advisable that all participants play in the same room. This make analysing the course of the game and holding the inter-generational conference easier. You should take care to ensure, however, that all generations can take their turns during the normal rounds in peace and are unable to confer with the other generations. The available resources should be arranged in such a way that the current availability can be seen from all generation tables.

Put in a visible place:

List of the most important rules

Six resources per generation

Six resources in reserve per generation (coloured differently from the normal resources)

On each generation table:

One printed playing mat

One printed set of price discs in three colours (with the first field visible after the start)

One set of printed event cards (15 event cards)

One opaque bag

Money for the bank (12 x 1s, 12 x 5s and 12 x 10s)

18 post-it notes or other paper slips for keeping track of the game's progress for interim analyses

Ten neutral tokens per participant piled next to the game area

At each seat:

91 currency units (10 x 1s, 4 x 5s and 6 x 10s)

Ten personal tokens (marked with an individual symbol)

One paper clip and set of choice cards for the anonymous rounds coloured in pink / red, blue and green

Game Objective and End of the Game

In total, the game should last between 1.5 to three hours. This time is used for the explanation (15 to 30 mins), the game (45 to 90 mins) and the evaluation (30 to 60 mins).

Objective of the Game

The objective for the participants is to place all their personal tokens while setting aside or earning as much money for their business as possible. The person with the most money at the end of the game is the winner (and maybe even receives a prize). – But beware: your personal resource decisions also influence the collective use of the resources, and the game will end as soon as there are no resources left. So it is a good idea to economise, while keeping an eye on the resources.

(The actual learning objectives for Resource Ration will not be disclosed to the participants at the start.)

Start of the Game

The youngest member of the generation decides who begins the game. Each player begins the game in the “Start” field.

End of Game Scenarios

Scenario A

As soon as the participants of a generation have laid down all their personal tokens, the entire game is finished.

Scenario B

Those who have spent all their money are out of the game. When around a third of the participants are out with no recourse to funds (loans or other measures agreed at the conference), the game also ends.

Scenario C

As soon as all the resources have been consumed, the game will end, as the businesses no longer have any foundation upon which to operate.

Course of the Game

Personal and Anonymous Rounds

In each round, the participants must make decisions regarding the use of resources in their company. The decisions are symbolised by setting down the tokens on the corresponding track (**pink** for **intensive** resource usage, **blue** for **efficient** resource usage and **green** for **renewable** resource usage). Each new token will be placed upon the next empty field on the corresponding track. The game progresses fundamentally in two alternating rounds of play: personal and anonymous.

Personal round:

Participants take turns in choosing a track (type of resource usage) and place their personal tokens on their chosen track. The investment in resources is paid out immediately in accordance with the information on the price disc. When all the participants in a generation have completed their personal turn, an anonymous round follows.

Anonymous round:

The participants once again choose a type of resource usage, but this time without disclosing their decision. They arrange their choice card so only the chosen colour is visible, secure the card and the money (amount in accordance with the information on the price disc for the chosen colour) together with a paper clip and place them in the opaque bag. As soon as all the participants in a generation have made their anonymous decisions, the bag is emptied. The money is checked and placed in the bank. Like the personal tokens, neutral tokens are placed on the next empty space on the chosen tracks. This ends the anonymous round, and a new personal round begins.

Important: If a track is completely full of tokens, the track can be emptied and used again. It is important for the interim analysis later on to make note of the fact that this track was the fullest, even if it appears emptier after the removal of the tokens.



Why are there Personal and Anonymous Rounds?

In real life too, we make decisions that are seen by others and decisions that others either cannot see or have difficulty seeing. Public decisions can garner praise or criticism and we can be made to account for them. We can neither be criticised nor praised for anonymous decisions, and so these decisions blend together with those of others to form an anonymous mass. In this way, companies can be seen to be operating very sustainably in public, while secretly adopting strategies that are very damaging to the environment and society – conduct known as greenwashing. A lack of transparency is a particularly significant problem with regard to procuring resources. It is often not possible to track the resources used by a company or a product to their source.

Actions

As soon as a token (personal or neutral) is placed on a field bearing a symbol, the participants are required, directly after payment and before the next decision, to carry out certain actions:

Price Change      

The price for each type of resource usage changes during the game in accordance with demand, supply and the nature of the game's progression. When a token is placed on a space containing a plus or minus symbol, the price disc of the corresponding colour (background of the field containing the symbol) is turned either once forward (for a plus) or once back (for a minus). Each symbol corresponds to one turn.



How do Prices Change?

Initially, intensive usage is the most cost effective, since this is not contingent on further technological developments. Over time, this approach becomes more expensive as supplies are depleted. Efficient resource usage is initially more expensive, because it requires certain technological advancements. Throughout the course of the game, it becomes initially more cost effective, because a) fewer resources must be purchased and b) the technological developments have been established. Over time however, efficient usage becomes more expensive once more, as it is based on the same diminishing pool of resources. At the beginning, renewable usage is by far the most expensive approach, since it requires not only technological developments but also far-reaching systemic changes. This approach becomes increasingly more cost effective over time as the technologies and new systems become more widespread and are continuously improved. Aside from this, this approach is unaffected by price increases caused by the dwindling supply of finite resources. Through these investments the company increasingly operates based on a cycle that either requires only the minimal input of new resources or relies on alternative resources (such as waste products or renewable raw materials), which in general are considerably cheaper. Of course, the developments on one track can also have an impact on the others. In this way, for example, increased use of renewable resources could lower the price of fossil resources should supply be greater than demand.

Event



External events influence the course of the game. As soon as a token is placed on a space marked by an event symbol, an event card is taken from the top of the pile and read aloud. The instructions on the card are then carried out immediately. In each case, event cards apply to all participants (within a generation), who must meet the conditions specified on the card.



What Significance do these Events Have?

Surprises cannot be ruled out in life. For the most part, these are external influences, which occur arbitrarily and can turn a company's strategy on its head. Event cards introduce such occurrences. The events can essentially be categorised into three different types: political decisions (e.g. subsidies, sanctions, bans), economic change (e.g. change in demand, economic crisis) and catastrophes (e.g. environmental disasters, accidents).

Interim Analysis

After each generation has placed down 20 new tokens (so every two to four rounds, depending on the number of participants), the game organiser interrupts the game. At this time the consumption of resources by each generation is analysed, legacies are passed down from one generation to the next, and company profits are collected.

Allocate the consumed resources: From the shared pool of resources, each generation will remove the resources consumed, corresponding to which track has been used most frequently within their generation:

- for the **pink** track (intensive resource usage): **three** resources
- for the **blue** track (efficient resource usage): **one** resource
- for the **green** track (renewable resource usage): no resources from the regular pool, but **one differently coloured resource from the reserve**

The consumed resources should be clearly visible on the generation table. Next, make note of the current status of all tracks for all generations using a post-it note. For the next analysis, only the tokens newly played are important.

Reveal the generations: Now is the time to reveal that the groups are actually generations and that their own behaviour has consequences for the subsequent generations. Make the identities of the respective generations visible. If you like, you can give the different generations visual or other identifying characteristics that show their age (e.g. beards for the first generation and bibs for the last generation or different voice pitches).

Legacy handover: A legacy is handed over from one generation to the next (from generation one to two, from two to three, and so on). The track with the most tokens from the previous generation determines which of the subsequent generation's price discs will be altered. In each case, the corresponding price disc will be moved forward **three**. The legacy from the last generation will be handed over to the first. While this may not seem entirely logical, it is nevertheless important for the mechanism of the game. In this way, each generation's decisions have an influence on another generation, and the first generation is still faced with price changes.

Pay out the earnings: After the interim analysis is complete, each player receives **20 currency units** from the bank. This payment symbolises earnings from the sale of products or services, which were manufactured or rendered through the consumption of resources. From these earnings each player must pay a tax, the amount of which is contingent on how many resources their generation has procured.

- if the generation has consumed **three** resources, **ten currency units** must be deducted as tax.
- if the generation has consumed **one** resource, **five currency units** must be deducted as tax.
- if the generation has consumed **no regular** resources, there is **no** tax to pay.

Tax is either directly deducted or repaid to the bank after payment of earnings. For the first cycle, to create a harmonious experience for the participants, it is advisable to give them the whole sum and then allow them to pay their tax afterwards.



What is the Significance of the Legacies?

During the legacy handover, the past catches up with the future generations. They experience directly the consequences of the decisions made by those who came before them. For example, if one generation has been particularly wasteful with resources, there will then be fewer resources available to their descendants. Conversely, the descendants benefit from technologies that were invented in previous generations. This has a direct impact on their well-being and scope for making decisions. In light of this, you could interpret unsustainable behaviour by one generation as the exploitation of the next, which is symbolised in the game by the handing out of money.



Does the Distribution of Resources Appear this Transparent in Real Life?

The distribution of resources between the different generations is somewhat overstated in the game. This is consciously designed to spark discussions in the inter-generational conference. First, by enabling pointed questions to be asked of individual generations, such as “Why have you used so many resources?” Second, this can also provoke strong emotions, such as anger towards a generation that has not behaved in a sustainable way, or perhaps feelings of guilt or shame from those belonging to generations that have not acted sustainably. These emotions help the participants to really appreciate the dilemma and then to reflect on it. In real life, it is unfortunately much more difficult to ascertain who is responsible for the exploitation of a particular resource. Particularly in the case of common goods, whose use has been unregulated for years, the core conflict often revolves around the questions of who has thus far benefited most from the resource, whether the resource has been fairly distributed and what the fair distribution of the resource might look like in future (e.g. regarding the emission of greenhouse gases or the management of international water systems).

Inter-generational Conference

The conference allows the participants, as a single community, to reflect on the progression of the game up until that point as well as the previous consumption of resources. In addition, it enables participants to uncover problems and discuss them. They also have the opportunity to agree solutions to the problems and influence the further course of the game. This could entail, for example, inter-generational agreements, introducing rules of conduct or even altering the rules of the game to a certain extent.

Convening the Conference

During the game a maximum of three inter-generational conferences will take place, each lasting between ten and 15 minutes. The conferences are convened and moderated by the game organiser. To uncover potential conflicts and give the participants the opportunity to find solutions, the game organiser should watch out for such issues and call two to three conferences during the game. Possible triggers for a conference could be, for example, the quick depletion of the pool of resources, players having a strong emotional response to the game, or one generation being visibly displeased with regard to the legacy they have received (starting from the second or third interim analysis).

Conference Opportunities

The game organiser can draw attention to conflicts during the conference by inviting players to briefly explain how they are finding the game. The players will learn the most from the conference if they use it to discuss their various perspectives and concerns and can develop different strategies for solving issues with the help of the game organiser. Through active moderation, actions based on sustainability and a sense of community can be made the focus of the conference, and there is an opportunity for collective problems to be tackled and solved.

At the same time, however, the game organiser cannot and should not force a consensus on any measures that are proposed: the decisive factor here is the mutual trust of the groups and their willingness to compromise. Decisions should nonetheless be consciously reached, reasons should be made clear and experiences reflected upon. During the inter-generational conference, it is important for the game organiser to ensure that the past (decisions taken and the current resource inventory) is not changed and that price decreases are not enacted without additional obligations. The rules of the game should remain as realistic and logical as possible. Both outcomes – if sustainable solutions were found or if no measures could be agreed upon – are legitimate and should definitely be discussed in detail during the evaluation phase.

How the Conference works in Practice

After the conference has been convened by the game organiser, all generations finish the round they are currently playing and take one or two minutes to analyse the decisions made thus far, their impact on resource consumption and the interaction of the various generations. In preparation for the conference, the generations formulate their observations, problems, desires and proposed solutions. After they have done this, all generations will stand up and either sit or stand in a large circle – ideally around the generation tables, so that these are both in the centre of the room and at the heart of the discussion.

The game organiser explains the time constraints, the objective and the fundamental possibilities of the inter-generational conference. Then the generations take over the discussion themselves. However, the game organiser may still provide their own input or ideas for possible decisions (a tax, no more anonymous rounds, lasting quantity discounts, exchange of technology, etc.) throughout the conference.

After five to ten minutes, the organiser will end the conference and summarise the measures that have been worked out and decided upon. All participants return to their places and continue playing the game in accordance with the newly agreed rules. Depending on the progression of the game and the

breadth of ideas put forward by the participants or the game organiser, the game organiser can call a second or even third conference.

Example 1:

The game organiser notices that generation three is increasingly frustrated with the legacy they have received from generation two and convenes a conference.

Intense discussions arise, but somehow no-one is willing to agree to any additional obligations or compromise on their demands. The participants cannot find any common ground. After five minutes, the game organiser brings the conference to an end. Since no consensus has been found and no new strategies or rules agreed, the game continues as before.

Example 2:

The game organiser notices that the resources are dwindling rapidly and calls a conference.

Generation three notices that it is the only generation who has invested in renewable resources. To curb the consumption of resources, the three generations agree that generation three's knowledge of sustainable technology will be given to generations one and two.

In light of this, the following set of measures were agreed: Generation three will pass on its knowledge of the renewable consumption of resources to generations one and two: they turn their renewable price back two. Generations one and two receive the knowledge from generation three: both turn their renewable price forward one. In exchange, generations one and two increase the price for intensive usage and invest in renewable resource usage: they turn the price for intensive use forward two and for the next two rounds they exclusively choose renewable usage. All generations must invest money to enact these measures, but they all benefit from the positive impact on the pool of resources.

Further Opportunities Presented by the Conference:

- Decision to do away with anonymous rounds and that the game will be played without the bag.
- Monetary penalty if a generation receives three resources during the interim analysis (that is, if they opted for intensive usage).
- An inter-generational donation from companies that have amassed a lot of money to companies that have little or no money as a consequence of, among other things, sustainable investments.

Evaluation

End of the Game and Settling Accounts

If scenario A, B or C, as detailed under “End of the Game”, occurs, the game organiser will end the game. All participants who have personal tokens left over must “play” them – in other words, they must buy resources at the lowest available price. Based on the behaviour of their generation, the price may be reduced, however. Members of generations with at least one renewable resource per player in their inventory must not pay for their remaining personal tokens, since they have already established a secure foundation for the survival of their businesses. Members of a generation with at least one renewable resource between them must pay half of the cost for the rest of their tokens. Members of a generation with no renewable resources in their inventory must pay full price for their remaining tokens.

Next comes the 30-60-minute follow-up discussion, which is moderated by the game organiser.

Objective and Impact of the Follow-up Discussion

The follow-up discussion is an integral part of Resource Ration as a simulation game. Its core function is to allow participants to step back from the roles in the game, reflect on what they have experienced and apply what they have learned to reality/their own lives.

The more intensive the follow-up discussions are and the more thorough the preparations of the organiser, the better the participants can fulfil the learning objectives.

Course of the Follow-up Discussion

The evaluation is separated into an introduction, four phases of in-depth follow-up discussion and a conclusion. The starting point for the follow-up discussion is the emotions of the individual participants (Phase 1), which will be structured and arranged through the use of observations (Phase 2). The insights derived from this phase will be analysed (Phase 3) and reformulated in the next phase, in such a way that they can be integrated into the lives of the participants (Phase 4). An assessment of the fulfilment of the learning objectives can be carried out after the follow-up discussion has come to an end.

It is advisable to run through all phases and, if you are short of time, to selectively exclude certain questions from each phase. In addition, we recommend that the participants are left to form and note down their own answers before they come together and discuss them as a group.

Introduction: “The person with the most remaining money at the end of the game is the winner. But beware: it is a good idea to economise, while keeping an eye on resource consumption. – With this goal in mind, the game began. The actual learning objectives were not disclosed to the participants at the start.

The winner is announced at the beginning of the follow-up discussion: the player with the most money receives the prize (if a prize is available). The participants are encouraged to analyse the outcome of the game using the following guiding questions:

- In your opinion, do you think the person with the most money is in fact the winner of the game?
- Did this person frequently opt to use resources intensively?
- Who is the winner of the game in your opinion? (For example, the generation that used the fewest resources, or all generations because together they were able to retain some resources?)

Phase 1: Emotions

This phase should be used to navigate the key points of the game:

- How satisfied are you with the result?
- Which aspects of the game did you enjoy and which did you find less fun?
- When did you feel you were treated fairly and when unfairly?
- How did you feel when you opted for intensive usage on the one hand and for renewable usage on the other?
- To what extent were your emotions during the anonymous rounds different to those you felt during the personal rounds?
- What feelings did the draining of the shared resources evoke in you?

Phase 2: Observations

In the second phase, events and observations are gathered:

- What was your strategy at the beginning of the game? Did you change your strategy during the game – why?
- What was the most dominant strategy in your group? Did this change during the game – why?
- How did prices change? To what extent was the change foreseeable?
- What were your observations during the conference(s)? Who convinced others to reach different decisions?
- What influence did the conference(s) have on the way the game was played?
- How much influence did each generation have over the consumption of resources?

Analysis

In the third phase, the observed events and their context within the game are analysed:

- Which strategy was the most profitable?
- Why did prices change during the course of the game?
- How did the interim analyses impact the behaviour of the generations?
- Why was it possible to conserve resources? Or why not?
- What is needed for an entire generation to take sustainable decisions?
- What is needed for the entire group to take sustainable decisions?

Transfer to the Real World

In this fourth and final phase, participants apply insights and experiences gleaned from the game to their own lives and relate these experiences to real-world behaviour:

- Why were so many resources exploited or distributed unfairly? (Here you may wish to explain the tragedy of the commons, if the participants are not yet familiar with the concept.
- Where have you encountered the tragedy of the commons in the real world? (Examples: overexploitation of resources, air pollution, climate change, water shortages, food shortages, etc.)
- To what extent do you feel partly responsible for a commons dilemma such as the wasting of resources?
- What role does personal gain play in life?
- What motives are behind acting sustainably on a daily basis?
- What is needed for society to develop in a sustainable way? Or what is needed to ensure that the needs of future generations are also taken into account?
- What role do politics, business and the population as a whole have to play here?

Ensuring the Fulfilment of the Learning Objectives

To ensure that the learning objectives have been met, you may wish to conduct an explanatory exercise¹. Here the participants should imagine that they are being asked these questions by their grandparents, and they should explain the answers using simple examples. The questions are based on the guiding theme and the learning objectives presented at the beginning of the introduction. The explanations can be written down, should the game organiser wish to read, evaluate and correct them afterwards. Alternatively, pupils can be paired off and take it in turns to ask and answer the questions, allowing for their partners to add to and feed back on what they have said.

- Why were so many resources exploited or distributed unfairly?
- When resources are overused or become scarce, what happens to the environment, to the economy and to society?
- Is society better off when we all behave sustainably? And why is this?
- Why, for the most part, do we continue to behave unsustainably?
- What is needed for us to put a stop to the overexploitation of resources?

¹ Formative assessment method “direct paraphrasing” taken from the book “Classroom Assessment Techniques” by Thomas A. Angelo and K. Patricia Cross (1993)

Background Information

Development

Resource Ration is a variation on triCO2lor, a game based on energy decisions and their influence on the climate. triCO2lor is a joint development by UCS Ulrich Creative Simulations and the environmental organisations myclimate and Ökozentrum Langenbruck. In 2008, the simulation game was recognised by the Swiss UNESCO committee as a project that promotes “Education for Sustainable Development” (ESD) and an “Activity of the UN Decade of Education for Sustainable Development in Switzerland” (DESD).

Further Development

The current version of the game was developed in such a way as to present various environmental topics with the same background – the tragedy of the commons – through the same material. The key mechanism of the game consists namely of bringing to life the impact of many individual decisions on one community and its environment. This experience, and the understanding that it cultivates, is of crucial importance for solving many problems concerning the environment. Existing topical variants of the game include this version centred on “resource usage” and the original version triCO2lor, which focuses on the topic “climate change”. Depending on the topic in question, the examples, explanations and visualisation are all amended. If you would like or have an idea for additional topical focuses for the game, you are welcome to create your own version of the game or ask us to collaborate with you in doing so.