MoRe Water

Monitoring and **Re**mediation of **Water**

– A Serious Game –

Game Manual

TECHNISCHE UNIVERSITÄT DRESDEN

Motivation

Conserving or restoring good **water quality** within a river catchment is a transboundary and multidisciplinary challenge. Accordingly, achieving sustainable effects requires collaborative approaches. Promoting such collaboration between a multitude of different disciplines and interest groups decides upon the success of any conservation effort.

In this context, **serious games** are a powerful tool for sustainable learning and collaborating. The game "MoRe Water" was created to practice strategies for river monitoring in order to identify sources of pollution, which finally allows for targeted remediation measures.

In a simulated case study, participants learn to analyse data in an unbiased way, to take action despite various limitations, as well as to understand stakeholders' specific perspectives and potential conflicts. It conveys analytical, collaborative and management skills and illustrates the complexity of interconnected factors in a tangible manner while also highlighting the socio-economic context in which any environmental challenge takes place.

Figure: Sampling at Riet River, South Africa.

The story

The **Riot River** serves as important water source, transportation route, recreation area and refuge for wildlife within its catchment area. A change in national water quality policies resulted in the establishment of the *Regional Council of Riot River* (RCRR). The RCRR is now responsible for analysing the Riot River to assess its remediation potential and includes members with diverse backgrounds and expertise.

First, the RCRR **characterizes** the catchment area regarding its dominating types of land use in 5 distinct regions (= PART 1). For this, teams of RCRR members are provided with a limited budget to perform sampling campaigns and then report their findings. Second, the RCRR **investigates** current incidents at Riot River to identify their cause and responsibility (= PART 2).

PART 1	2 – 16 players	~ 90 min.
PART 2	4 – 16 players	~ 45 min.

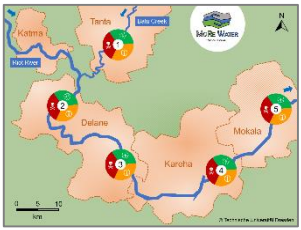
Note: PART 1 and PART 2 can be played separately or as one. In addition, a "game master" (= *Head of RCRR*) is required who knows the game (and the correct answers) and moderates the game session as well as provides advice where needed.

Find more scenarios, information and supporting materials on the website!
https://tu-dresden.de/bu/umwelt/hydro/hydrobiologie/limnologie/forschung/serious-game/MoRe-Water

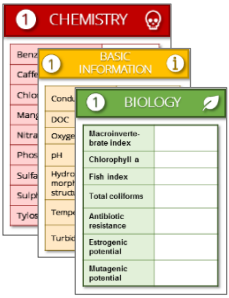
Component list

PART 1: Identifying the status quo

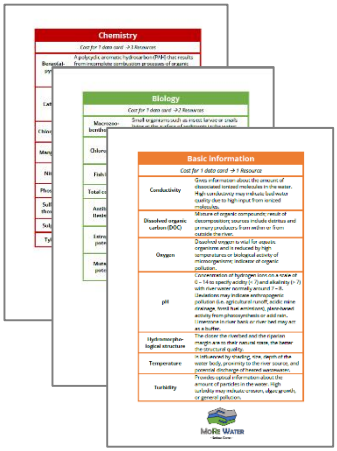
Map



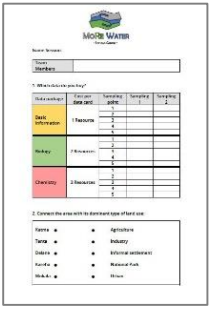
Data cards



Information cards



Report cards
(+ download)



Resource markers
(→ download or self-made,
i.e. dried beans, coins, etc.)

Download (supporting) materials:
https://tu-dresden.de/bu/umwelt/hydro/hydrobiologie/limnologie/forschung/serious-game/MoRe-Water

How to play

PART 1: Identifying the status quo

The objective: Match the correct type of land use (agriculture, industry, informal settlement, national park, urban) to each of the 5 areas on the map (Delane, Mokala, Kareha, Katma, Tanta). The team with the most correct answers wins; in case of a tie the team with the most remaining resources wins.

1. Organize the **data cards** in sorted stacks
2. Form up to 4 teams (i.e. at separate tables)
3. Introduce the story and game
4. Each team receives 1 **map**, 12 **resource markers**, 1 set of **land use markers**, 1 **information card** and 1 **report card**
5. Teams plan the first sampling campaign – which **data cards** are they planning to buy?
6. Sampling 1: teams buy data cards
7. Teams discuss – do they need more data cards?
8. Sampling 2: teams buy data cards
9. Teams discuss → Hand in **report cards**
10. Evaluation, announcement of winning team and concluding discussion

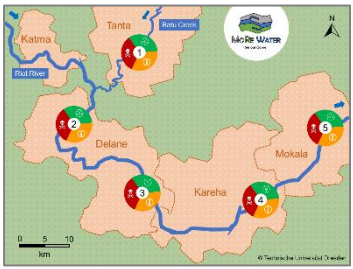
Note:

- There are 3 Types of data cards (= basic information, biology, chemistry) for every sampling point (1, 2, 3, 4, 5), which makes a total of 15 different available data cards
- Within one sampling, teams can buy as many data cards as their resources allow
- No restocking of resources possible
- Communication between teams is allowed

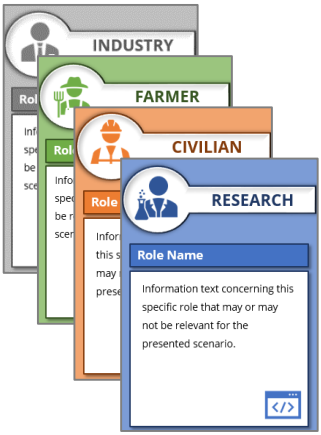
Component list

PART 2: Detecting traces

Map



Role cards



Information card

Articles

Land use markers
(→ download)

Download (supporting) materials:
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How to play

PART 2: Detecting traces

The objective: Identify the responsible stakeholder group (civilian, farmers, industry, researchers) that directly caused the presented incident. The responsible stakeholder team has to protect themselves and get through both votes without being nominated.

1. Everyone draws a ***role card*** (they may announce their role name, but the information text of their card is a ***secret***! Nobody is allowed to show it to anyone!)
2. Form teams according to stakeholder groups → they may communicate discretely ***within their team*** who caused the incident (they have to protect their team!)
3. Introduce the map with its 5 land use regions and then **article 1** to everyone
4. Everyone introduces their role and what they do
5. Every team receives a **map** and **information cards** → discussion within/between teams
6. Reveal **article 1** + **article 2** to everyone → discussion within/between teams
7. Teams vote which stakeholder group they think should be investigated
8. If consensus vote is wrong → reveal **article 3** + **4** and vote again; if consensus vote is correct → reveal **article 3** + **4** and vote which specific role to investigate
9. Reveal and concluding discussion

Note:

- With less than 16 people: make sure the "guilty" card/s (with a red skull) is/are handed out to a participant!
- Some newspaper articles are relevant hints, others are irrelevant information
- Lying or bluffing during discussions – all is allowed!
- Each team has 1 vote

Correct answers

PART 1

Scenario 1: For detailed explanation concerning land use indicators visit the website!
Delane → National park
Kareha → Agriculture
Katma → Industry
Mokala → Urban
Tanta → Informal settlement

Scenario 2, 3, 4: for a new scenario exchange the data cards (see website for materials)

PART 2

Scenario 1: Farmers in Kareha agricultural region directly contributed to the incident. The livestock farmer administered an excessive amount of pharmaceuticals to his animals due to poor husbandry conditions. Consequently, the manure that was then provided to the maize cultivator contained high concentrations of veterinary pharmaceuticals and antibiotic resistant bacteria. A lack of adequate riparian strips and vegetation on these soy fields promoted runoff into the Riot River. Heavy rainfall after an extended dry period washed these toxic residues and bacteria that accumulated on the soil into the river, affecting humans and wildlife downstream.

Agriculture was addressed since it is one of the most relevant and complex contributors of pollution. This does not imply that farmers alone are responsible, participants should recognize the complex network of interdependent factors and the involvement of all stakeholders, directly or indirectly.

Scenario 2, 3, 4: for a new scenario, exchange the "guilty" card/s and articles (see website for materials)

Contact

For questions, suggestions or support for hosting game sessions contact the developers team or the Institute of Hydrobiology at Technische Universität Dresden.

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Website: https://tu-dresden.de/bu/umwelt/hydro/hydrobiologie/limnologie/forschung/serious-game/MoRe-Water

Chair of Limnology
Institute of Hydrobiology
Technische Universität Dresden

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