

## INVESTIGATION - LEARNING MODULE

### The effects of water management on shaping the landscape



*Reconstruction of the Mosoni Duna riverbank in the inner city of Győr (before & after)  
**Solvex, ÉDUVIZIG (2017)***



## Introduction

Well-known slogans as “Győr, the city of rivers” or “Győr, the city of meetings” indeed have a basis, since four rivers are running together within the borders of the settlement. The four river coastlines are altogether 47 km long. The riverbanks of the inner city have been completely renovated between 2012 and 2014 in the frame of a major water management European Union project. The primary aim of the project was the improvement of water quality and quantity, as well as the enlargement of the ecological potential, the reconstruction of water habitats, and the preservation of flood-security. However, the project also targeted social purposes, like the improvement of urban landscape, boosting water and ecotourism, as well as building walking paths along the river. Between 2012 and 2014, during the renovation, the riversides within the inner city have been covered with concrete, and walking paths have been developed next to the rivers. This is a novelty, since before that the riversides were hardly walkable because of the half-natural state and the overgrown vegetation, therefore there was no real connection with the water surface. Today, the riversides are walkable for several km long. As for the vegetation, you can find the remaining river forests, however, during the flood control works of the past years, the tree vegetation have been significantly decreased. In connection with the inner city coastline, several flower beds were formulated. All in all, today, the landscape of the riverside is more artificial, however, it is more transparent, and the water can be closely observed.

The above is a great example on how water management and river regulation can influence the connection to water surfaces within a city or urban area. However, river regulation and water management is not only important from an aesthetic sense. Within this module, students will have the opportunity to understand the need of human intervention into the shaping of water surfaces/landscapes.

The investigation can be implemented by following these steps:

### 1) **Planning**

In Planning, students and teachers design their investigation activities on landscape, for instance they decide what to do, how to do it, when to do it, where to do it.

According to the topic or issue chosen for investigation, the class will need to identify what kind of actions to undertake in terms of literature review, hands-on research activities, and it will identify the most suitable methods and list the needed materials to gather the necessary information.

Expert stakeholders from local research centres, universities and local authorities can be contacted as a valuable opportunity to access up-to-date knowledge and to make use of scientific equipment.

### 2) **Performing**

In Performing the investigation, the class implements the devised plan, and follows the steps of action along the project timeline. Data collection can regard environmental data during a field trip, a survey on the perceptions and views of the local community, or investigations on historical and artistic documents regarding the landscape of interest. Specific materials, equipment and worksheets can be used, allowing students to approach methods and software of common use in research. Experiments can be performed to understand the reason for certain phenomena.



### 3) Data analysis and interpretation

In Data analysis and interpretation, the collected data are analysed and interpreted in order to understand the extent of the environmental issue (generating new knowledge) and the relations between the factors and variables that are involved in the investigation.

#### Objective of the Investigation

To learn about:

- ✓ The different aspects of water management
- ✓ Specific needs and reasons for the intervention in the water landscapes
- ✓ Advantages and disadvantages of reshaping and reconstructing water landscapes
- ✓ Changing behaviours and attitudes according to river regulations

To be able to:

- ✓ observe and evaluate effects of water management and/or river regulation
- ✓ plan a scientific experiment/project
- ✓ debate on a divisive topic, using pros and cons

#### HOW TO INVESTIGATE

**When:** After the Conceptualization Phase (Step 2)

**Time estimated:** 3-4 teaching sessions

**Where the activity takes place:** in the classroom and outdoor (field visits)

**Method (how the students have to work):** group-work

**Art activity** - in every step of investigation students are invited to produce an artistic product about their investigations: texts, photos, drawing, videos, music or sound, meme (images, videos, piece texts, etc., typically humorous in nature, that is copied and spread rapidly by Internet users, often with slight variations. <https://en.wikipedia.org/wiki/Meme>), patchwork/collage, theatrical performances.

In the classroom, the students are divided in groups and the students could follow the suggestion in the table below.

<b>Planning</b>	After selecting the location for the investigation activities, focus on the followings: <ul style="list-style-type: none"><li>● Introduction of water management and river regulations. (Main aims, historical references, radical changes in river basins and coastlines). This can be done by facilitating teachers or with the involvement of local/external experts. Historically significant river</li></ul>
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	<p>regulations can also be presented (for example the river regulation of the Old Danube in the 19<sup>th</sup> century).</p> <ul style="list-style-type: none"> <li>• Select and present photos showing the same river sections, but in different ages. Students should be able to realize the changes (riverbanks, flow-regulation, vegetation, etc.). Brainstorm about the changes, and how it could effect the life of different target groups (for example city dwellers, anglers, children, etc.). Try to list a pros and cons list for changing the nature of water landscape.</li> </ul>
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<p><b>Performing</b></p>	<p>After the Planning phase, students are encouraged to perform one or more of the following activities, focusing on the main research question: <i>What effects river regulations/water management can have on the water landscapes and the local neighbourhood?</i></p> <ul style="list-style-type: none"> <li>• <b>Analysis of water levels/Practical observation</b> (urban landscape): In the frame of a fieldtrip, students can take photos (on previously determined spots), in order to analyse the water level. Students shall perform this activity multiple times, so that the changes can also be observed. Potential research questions are: is the water level of the river sufficient or not sufficient? What problems can it cause?</li> <li>• <b>Observing changing behaviours and attitudes:</b> Students can prepare a short questionnaire/interview (a sample is available in Worksheet 1), and then ask around during a field trip local residents, what do they think of the river regulation (or other major water management issues) in their neighbourhood. Do they feel better connected to the water landscape? Do they think the intervention in the natural area was necessary?</li> <li>• <b>Why do we need river regulation?</b> Interview with an external expert in the field. Facilitators/teachers can contact external experts, who are familiar with water management and river regulation issues. Groups of students should make an interview with the selected expert, and then conclude the lessons learnt. A sample for the interview is available in Worksheet 2.</li> </ul>
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<p><b>Data analysis and interpretation</b></p>	<p>After the data collection, data should be analysed and discussed, in order to highlight the specific relations, and to give answers to the formerly asked research questions. Data analyses can be facilitated by the teachers and/or external experts.</p>
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## WORKSHEET 1 – Sample questionnaire for behaviour changes through river regulation

Collect questions for the **profile of the respondent** individually (gender, age, occupation, education, etc.)

1) How long have you been living near the (examined) water landscape?

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2) What changes have you observed (if any) on the water landscape since then?

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3) How do you like the changes of the water landscape? (1-4, where 1 means 'I don't like it at all' and 4 means 'I like it very much')

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4) How often do you visit the neighbouring water landscape? (daily/weekly/monthly/rarely, etc.)

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5) What do you do during your visit?

- a) recreation, relaxing
- b) (water) sports
- c) animal/bird watching
- d) socializing
- e) other, etc.

6) Did the changes of the water landscape (regulations/reconstructions) affected the frequency of your visits and/or your activities? If yes, how?

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7) How would you rate the overall landscape? (1-4, where 1 means 'I don't like it at all' and 4 means 'I like it very much')

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8) What do you think about the vegetation of the water landscape?

- a) It is in great harmony with the water landscape
- b) It is more or less in harmony with the water landscape
- c) It is rather poor and there is no harmony with the water landscape

9) How would you rate your knowledge on river/water landscape regulations? (1-4 where 1 means 'I don't know nothing at all' and 4 means 'I know a great deal')

10) Do you think that the river/water landscape regulations are necessary?

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11) What improvements could be done in order to make the water landscapes more attractive?

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## **WORKSHEET 2 – Sample interview for external experts (water management or river regulation)**

1) What organisation are you working for?

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2) What are the main aims/activities of your organisation, and how is it connected to the water landscapes?

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3) What are your responsibilities and how is it connected to water management?

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4) Can you tell us about your most important projects/works concerning the interventions in water landscapes?

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5) What are the main advantages of water management/river regulations? Why are they necessary?

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6) What are the main disadvantages of water management/river regulations? Are there any conflict of interests?

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