



River pollution and economic impact

Modules:

**Impacts of human intervention
on river ecosystems**

River management

Total duration: 7 hours

Field work: Yes

List of materials:

- Map of the town/area of investigation,
- Digital camera, a video camera.
- Questionnaire on pollution factors and economic activity.
- Video
- PPT with photos, paintings, cards, maps
- PC

Worksheets: 5

Students' age: 16-18

Use of apps/software: Excel or worksheets

Brief description

The immense impact of environmental pollution on people's daily lives has increased the importance of conducting research that will enable scientists to assess environmental damage in economic terms. Such an assessment will improve the ability of the public to quantitatively grasp the impact of environmental pollution and the effectiveness of existing environmental policies. In recognition of these facts, environmental economists have begun searching for viable methods to estimate economic losses resulting from environmental pollution.

The economic impacts of river pollution are an important factor to determine the priorities for investments in pollution reduction projects. By reviewing economic activities such as fishing, tourism, shipping, hydro-power etc. as well as the economic dependence on access to reliable water resources, the value of pollution reduction can be more adequately assessed.



With this small research we will try to evaluate the economic impact of river pollution on industry, Farm Yields, Livestock, Fisheries and tourist activities but also in the human health by measuring the economic losses that arise in the local economy.

Keywords: pollution, economy, environmental and economic variables, economic consequences.

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Objective of the learning unit

To learn about

- ✓ The relationship between pollution and economy.
- ✓ The economic impact of river pollution on industry, farm yields, livestock, fisheries and tourist activities
- ✓ The economic impact of river pollution on the human health by measuring the economic losses that arise in the local economy.
- ✓ The priorities for investments in pollution reduction projects

To be able to:

- ✓ Plan an investigation
- ✓ Make observation and use Excel or open source worksheet



Introduction (orientation)

Time estimated: 10 minutes

Where the activity takes place: in the classroom, using PC, beamer and Internet

Method (how the students have to work): class brainstorming

Instructions for the teacher:

1) Introduction to the topic

Power Point presentation videos are shown to introduce the topics (pollution, economy, environmental and economic variables, economic consequences).

<https://www.youtube.com/watch?v=pjl54VRgjSM>

<https://www.youtube.com/watch?v=Y0J7BR9xdhU>

Then there is a brainstorming session to bring out the students' previous knowledge and experiences about this issue. Students are asked to make a conversation about river pollution and economic consequences. For instance, by asking:

"Have you noticed if there are garbage and other wastes in the river in your area?"

"Do you think they are having financial consequences?"

Conceptualization

Time estimated: 20 minutes

Where the activity takes place: in the classroom

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

Instructions for the teacher:

The students, divided in groups, formulate a hypothesis about the pollutants and the economic effects.

Then they are given the worksheet 1 to make a discussion.

According this worksheet, they are asked the following questions:

"Which pollutants and from which source (garbage, waste, materials ...) exist in the river?"

"What economic impacts they may have?"

"Which economic sectors of the local and wider economy are affected?"

Investigation

Time estimated: 90 minutes

Where the activity takes place: in the classroom and outdoor

Method (how the students have to work): group-work and as whole class

Instructions for the teacher:

In the classroom, the students are divided in groups.

1) Planning

In the classroom, ask students:

“How we could measure the economic impact of river pollution on the local economy?”

The students should generate an investigation plan. The objective is to assess the influence of the river pollution on the local economy.

Duration: 20 minutes

- Students select on the map an area where they want to perform the investigation
- Students decide how to perform the investigation (materials, methods).
- The groups present their investigation plans and find an agreement for the most reliable and feasible.

2) Performing

Outdoor, at the river, with the whole class, students implement their investigation plan. They use the materials listed in the previous step, make photographic surveys with video and photo-cameras.

They use worksheets 2 (about observation on waste and financial consequences) and 3 (to indicate the type of investigation about economic effects).

Students walk along the path and fill in the questionnaire (worksheet 3) at the agreed stops. They also record environmental and economic variables.

Duration: 60 minutes

3) Data analysis

In the computer lab or at home, the whole class or in groups, students report the data of the filled-in questionnaires into an Excel file (template available). They can elaborate the questions in term of frequencies for each scale point used in the questions, make comparisons between stops and gender comparisons.

Duration: 40 min

Conclusion

Time estimated: 30 minutes

Where the activity takes place: in the classroom

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

Instructions for the teacher:

The different groups report their conclusions on the activities carried out using worksheet 4 and 5:

- Variations of pollution factors and number of observations.

- Awareness of the problem and the importance on the economic effects on the local economy.
- Awareness of the type of economic activity being affected.

The Students compare the final results of their survey with the hypotheses formulated in the conceptualization phase. After careful discussion and comparison, students report their observations in a final worksheet.

The conclusions should lead to understand the economic problems that river pollution creates in local and wider economy.

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Discussion

Time estimated: 60 minutes

Where the activity takes place: in the school auditorium

Method (how the students have to work): in groups

Instructions for teacher:

Students in groups present their findings to the whole school and discuss them in comparison to the hypothesis they formulated in the conceptualization phase. They can use PowerPoint, etc.

The discussion should lead to understand the economic problems that river pollution creates in local and wider economy.