

Educational simulation on water-agriculture policy integration

This Case was created as a reusable policy simulation game in which students represent agricultural and water stakeholders and negotiate policy trade-offs related to water use and agricultural practices.

It was designed to teach policy integration and real-life stakeholder interaction over competing interests in environmental governance. The following guide to the simulation includes background context on water-agriculture tensions in the EU policy landscape, negotiation rules, and instructor guidelines.

1. Background: Water and Agriculture in the European Union

Water and agriculture are deeply interconnected in the European Union. Agriculture accounts for around a quarter of total water abstraction across the EU (Scholten et al. 2025), with significantly higher shares in southern Member States where irrigation dominates water use. At the same time, around 40% of the EU's land area is used for agricultural production (EUROSTAT, 2022). This makes farming one of the most influential sectors shaping Europe's water resources.

According to the European Environment Agency (EEA, *Europe's State of Water 2024*), agriculture remains the most significant pressure affecting both surface waters and groundwater across the EU. Agricultural pollution impacts around 90% of river basin districts, primarily through nutrient runoff (nitrogen and phosphorus), pesticide residues, and water abstraction. Diffuse pollution from farming is a major cause of eutrophication, while irrigation practices in Mediterranean regions contribute to over-abstraction and declining groundwater levels.

Eutrophication is an ongoing challenge. Recent Joint Research Centre (JRC) assessments indicate that 36% of EU rivers are eutrophic due to excessive nutrient loads, in some cases leading to hypoxic "dead zones" (Bertassello et al. 2025). Groundwater bodies are also affected by nitrate contamination, often linked to intensive livestock production and fertiliser use. At the same time, farmers themselves face growing water-related risks, including droughts and water scarcity, which have become more frequent and severe in several European regions due to climate change.

Responses to these challenges exist at EU level, since EU has a long history of water-related legislations (e.g. [Urban Wastewater Treatment Directive](#) (91/271/EEC), [Nitrates Directive](#) (91/676/EEC), [Water Framework Directive](#) (2000/60/EC), [Marine Strategy](#)

[Framework Directive](#) (2008/56/EC), etc.). The Water Framework Directive (WFD), adopted in 2000, is the cornerstone of EU water policy. It aims to achieve “good ecological and chemical status” for all EU water bodies, implemented through six-year cycles of River Basin Management Plans. The final deadline for achieving good status is 2027. However, progress has been slow: in 2021, only 37% of Europe’s surface water bodies were in good or high ecological status, and no Member State is expected to achieve 100% compliance by 2027 (European Commission 2025; WWF 2021).

In parallel, agriculture is governed by the Common Agricultural Policy (CAP), one of the EU’s oldest and most financially significant policies. Historically focused on productivity and food security, the CAP has progressively integrated environmental objectives, especially in its post-2020 reform. Nevertheless, the CAP primarily relies on financial incentives (e.g. direct payments and rural development funds) while the WFD is largely regulatory, imposing legally binding environmental obligations.

Although there is no formal legal contradiction between the WFD and the CAP, tensions exist in practice. Agriculture is a major source of water pollution, yet farmers depend on CAP payments that often prioritise productivity and economic viability. Differences in policy instruments (e.g. financial vs regulatory) can make coordination difficult and generate implementation gaps at national and regional levels.

These structural tensions are particularly visible in specific territorial contexts, such as the Dutch peat meadow region.

2. Policy dilemma: The Dutch peat meadow region (Veenweidegebied)

The Dutch peat meadow region (veenweidegebied) provides a concrete example of the complex interaction between water and agricultural policies. This low-lying landscape, traditionally used for dairy farming, has been managed for centuries through drainage systems that lower groundwater levels to enable grazing and grassland productivity.

However, peat soils oxidise when drained, leading to land subsidence, greenhouse gas emissions, and nutrient leaching into surface waters. Lowered water tables contribute to nitrogen and phosphorus runoff, deteriorating water quality, and complicating compliance with EU water legislation.

Under the Water Framework Directive, the Netherlands is required to achieve good ecological and chemical status in its surface and groundwater bodies. In peat areas, improving water quality and reducing subsidence would require raising groundwater levels (rewetting), restoring wetlands, and reducing nutrient leakage. From a water

management perspective, higher water tables are essential to stop peat oxidation and improve ecological conditions.

At the same time, CAP funding, particularly through the European Agricultural Fund for Rural Development (EAFRD, Pillar II), has supported investments in submerged drainage systems in peat meadow areas. Projects such as Lange Weide have installed extensive drainage infrastructure designed to maintain sufficiently low groundwater levels for dairy production while slowing subsidence. These investments are framed by farmers as essential for farm viability and regional economic sustainability.

This creates a policy dilemma. Rewetting peatlands to comply with WFD objectives would reduce grassland productivity and challenge the dominant dairy farming model. Farmers rely on CAP payments that historically reward production and land use intensity, making large-scale rewetting economically unattractive. Moreover, once drainage infrastructure is installed, reversing it becomes costly and politically sensitive. Although alternative practices such as “wet dairy farming” and paludiculture are being piloted, they remain marginal and financially uncertain.

The Dutch peat meadow case thus illustrates a structural tension between regulatory water objectives and financially supported agricultural practices. While the WFD requires ecological restoration and stricter environmental standards, CAP-funded investments make drainage attractive and thus reinforce land-use practices that undermine those goals. The dilemma is not one of legal incompatibility, but of institutional design, economic incentives, historical practices and livelihoods.

This case invites students to explore how different actors (especially farmers and environmental-water initiatives) might negotiate trade-offs between economic viability and environmental restoration.



Veenweidegebied

Source: Wikipedia

3. Protocol: Rules of the negotiation (TOTAL TIME ESTIMATED: 1h45)

Students are confronted to real-life challenges of compromise-seeking when very different interests are at play, using the Dutch peat meadow region as a dilemma case-study.

Participants are divided into two teams of max. 6 students per team:

- **Team 1 – Peatland Protection Initiative**
- **Team 2 – Dairy farmers in the peat meadow region**

At the start of the simulation, students are reminded that the objective is not to win, but to reach a plausible and implementable agreement that balances environmental restoration and farm viability.

Team roles and constraints

TEAM 1 - Peatland protection initiative	TEAM 2 - Dairy farmers
You are members of a local community initiative advocating for peatland restoration and improved groundwater status. You have: • Strong human resources (activists, volunteers, campaign capacity) • Legal tools (possibility of court action under WFD obligations) • Public communication capacity • Very limited financial resources You do not control: • Agricultural subsidies • Farm-level production decisions • Large-scale funding	You are dairy farmers operating in the peat meadow region. You have: • Received CAP subsidies supporting drainage systems • Farm revenues that are just sufficient to cover costs • Long-standing family ties to the land • Political voice through farmers' organisations You do not control: • EU regulatory requirements under the WFD • Broader water management policy

Simulation rules

Part 1 – Internal strategy (40 minutes)

Teams work separately to prepare their argumentation. No contact between teams is allowed during this phase.

Objective of this phase of the simulation: Define red lines (i.e. non-negotiables), acceptable compromises, and policy instruments each team plans to use in the negotiation

On a Google doc, students have access to additional material on the case-study that they are inviting to browse through, and to 3 guiding questions they have to fill in. They are free to choose how to do so: they can designate a note taker at the start of their discussion, who can fill in the answers to the questions progressively, or they can discuss in group first and write down their conclusions at the end of their discussion.

Suggested time-frame:

- 10-15 minutes: Review background material
- 25-30 minutes: Discuss and answer guiding questions in the private Google document

Questions noted in the Google doc are identical for both teams:

1) **Goals** - What are our core objectives in this case, and which elements are non-negotiable?

2) **Resources** - Which EU or national policy instruments can support our objectives in this case? (search the links below and the material we've covered before, then if helpful feel in the table below).

Category	Selected Tool	Why this tool?	Who pays?	Who benefits?
Rule				
Money				
Innovation				

3) **Compromise** - Which compromises or adaptations could we accept if our core objectives are safeguarded?

Explain: ...

What does this transition plan imply?

- ☐ Immediate change
- ☐ Gradual transition
- ☐ Pilot project first
- ☐ Zonation approach

☐ Other: describe

Resources available to both teams are listed below:

- COMMISSION STAFF WORKING DOCUMENT. 2017. *Agriculture and sustainable water management in the EU*. Pages 1-5 and 10-16.
- NL2120: Nature based solutions <https://www.nl2120.nl/veenweidegebied/> (use automated translation for English)
- CAP funds <https://eu-cap-network.ec.europa.eu/sites/default/files/2025-08/eu-cap-network-good-practice-report-natura-2000.pdf>
- Smart solutions ? <https://www.smartrural21.eu/smart-solution/climate-smart-farming-on-peatlands/>
- Dutch farmers association view point 1) <https://www.lto.nl/lto-positief-over-glb-voorwaarden-in-2025/> 2) (use automated translation for English)

BREAK (10-15 minutes)

Part 2 – Negotiation (30–40 minutes)

Both teams meet in plenary.

Protocol:

1. The moderator asks each team to present **(5 minutes per team)**:
 - Their core objectives
 - Their Non-negotiables
 - What solutions they propose
2. The moderator then asks teams to jointly discuss **(20 minutes)**:
 - What problem do you jointly recognise in the Veenweidegebied, even if your priorities differ?
 - What solutions from the other team would you like to reject and why?
 - Which solutions from the other team are you willing to accept and why?
3. The moderator then asks both teams to reach a final agreement on a combination of measures that can both improve or maintain water quality, without impacting significantly farmers' livelihoods. They are also asked to reflect on what they anticipate is going to be the consequence of implementing these measures for both teams **(10 minutes)**.

If time allows, students can perform a “feasibility check” by answering the following table:

Question	Yes/No	Explanation
Is the compromise legally defensible?		
Is it economically realistic?		
Is it politically plausible?		
Does it improve water status?		
Does it maintain farm viability?		

NB: Personal attacks are not allowed; arguments must refer to:

- Policy instruments
- Legal frameworks
- Economic feasibility

Part 3 – Reflection (10 minutes)

In plenary discussion, students reflect on:

- What was easy?
- What was difficult?
- Which arguments were most persuasive?
- Where did EU policy design create tension?

4. Learning objectives

Background Objectives

- Explain the interaction between the Water Framework Directive and the Common Agricultural Policy.
- Identify structural tensions between regulatory and financial policy instruments.
- Understand how agricultural practices contribute to water quality challenges (eutrophication, nutrient runoff, groundwater decline).

Analytical Objectives

- Analyse how different actors operate with asymmetric resources (legal vs financial).
- Recognise how policy legacies shape negotiation positions.
- Evaluate trade-offs between environmental objectives and economic viability.

Practical Objectives

- Develop a policy compromise that is politically and economically realistic.
- Practice structured negotiation under institutional constraints.
- Reflect on the challenges or "wicked problems" of sustainability transitions

5. Instructor notes

Points to take away from the exercise

1. Problem framing

What aspects of the issue do students focus on: Water quality? Food security? Economic survival? Climate mitigation? Rural identity?

2. Use of policy instruments

What instruments do students choose to select: CAP eco-schemes? Rural development funds? WFD legal enforcement? National financing?

3. Creativity of compromise

How creative are students in proposing solutions? Do they rely mostly on the material from the class, or do they propose self-made solutions?

As a note for the instructor, possible solutions not directly mentioned in class (although some allusions to funding options can direct students in this direction) could be:

- Gradual rewetting with compensation
- Transition subsidies for wet agriculture
- Pilot projects for paludiculture
- Phased drainage removal
- Performance-based payments

References

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