Seminar 3

WATER MANAGEMENT UNDER CLIMATE CHANGE: STUDIES FROM A MULTIDIMENSIONAL PERSPECTIVE

Introduction

On 9 July 2026, HEG Fribourg hosted the third and final seminar of the UNITA Starting Grant project on water governance under climate change. The day brought together specialists in engineering, water management and law around a shared question: how can water be managed better in an increasingly uncertain climate?

The seminar was opened by Prof. Pascal Wild, Director of HEG Fribourg. Three presentations and a roundtable followed.

Opening: Prof. Pascal Wild, Director of HEG Fribourg

Prof. Wild welcomed participants on site and online, and thanked the project partners as well as Dr Marta Domini for coordinating the seminar series. He noted that even in Switzerland, a country considered rich in water, heatwaves, retreating glaciers and falling river flows show that abundance cannot be taken for granted. Three ideas guided the day. First, climate change does not create the water crisis but reveals it: ageing networks, rules designed for a stable climate, and unequal access. Second, water is at once a technical, economic, legal and political issue, and no single discipline can address it alone. Third, better forecasting is no longer enough: systems must be designed to adapt to the unexpected.

D.ssa Marta Domini, University of Brescia

D.ssa Domini, as principal investigator of the UNITA project, presented the project's aim, objectives and activities, of which the seminar is part.

Prof. Sabrina Sorlini, University of Brescia

Resilience of drinking water systems in Italy

Prof. Sorlini presented a survey conducted in 2025 among 21 Italian drinking water operators. All of them had faced at least one emergency between 2022 and 2024: drought, power outage, severe weather or sudden contamination.

The survey reveals several weaknesses. Most infrastructure is more than thirty years old, many networks cannot operate for more than 24 hours without electricity, and some depend on a single water source. Operators mainly invest in network monitoring and leak detection, but still very little in new resources such as treated wastewater reuse or aquifer recharge.

Her conclusion: resilience is still mostly seen as the ability to react to crises. It now needs to be prepared in advance, by diversifying water sources, training staff and building it into company strategy.

Dr Ali Ben Yahia, University of Tunis

Rethinking water governance in the face of scarcity

Dr Ben Yahia described the situation in Tunisia, where the water available per person is well below the scarcity threshold. In the south of the country, wells that once flowed naturally are now almost exhausted because of the spread of boreholes and pumping.

He showed that so-called water-saving technologies are not always enough. Drip irrigation or solar pumps can even increase total consumption if the water saved is used to irrigate more land. Without rules to limit abstraction, technology can speed up the depletion of groundwater.

He proposes combining traditional knowledge, such as small earth dams (*jessour*), cisterns and water-sharing turns, with modern tools such as smart meters, sensors and groundwater monitoring. He stressed the role of local communities and associations, without which equipment is likely to be abandoned.

Prof. Vera Parisio, University of Brescia

The water service in Italy, between competition and solidarity

Prof. Parisio presented the legal framework for water in Italy. The law recognises water as a fragile and limited resource that belongs to the public domain and must be protected for future generations.

She examined the different ways of running the water service: through a private company selected by public tender, a mixed public-private company, or a public company controlled by the municipality. In her view, no option is better in itself. In practice, none has succeeded in sufficiently modernising networks, which lose up to 40% of their water in some regions. Tariffs are often kept low for political reasons, and public investment is insufficient.

She recommends that each municipality clearly justify its choice of management model in terms of environmental protection and the needs of its population, and that efforts be made to save water, particularly in agriculture.

Roundtable

The roundtable gave speakers the opportunity to compare their perspectives and look for a common language across disciplines.

Conclusion

The three presentations, coming from different disciplines and countries, converge on a simple message: the water crisis is not only about climate, but also about how water is managed, financed and shared. Technology is useful, but it must go hand in hand with clear rules, sustainable funding and user participation.

The seminar also showed the value of exchanges with countries on the southern shore of the Mediterranean, which are already experiencing the scarcity that Europe will face tomorrow. It led to a scientific article that takes these reflections further.

Acknowledgements

We thank Prof. Pascal Wild, Director of HEG Fribourg and Greta Balliu, Associate Professor, for hosting the seminar and supporting the project; Dr Marta Domini for coordinating the project; the speakers for their contributions; participants on site and online; and the UNITA alliance and the European Union for their support.