Dossier's Presentation:
Water Risk: Between Hope and Scarcity
Presentación del dossier:
Riesgo hídrico: entre la esperanza y la escasez

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1. Introduction

According to the *Global Risks Report 2025*, the second most significant global risk at the territorial level consists of extreme weather events (Elsner, Atkinson & Zahidi, 2025). Looking at the medium term (10 years), five of the top ten risks are associated with environmental factors: beyond extreme weather events, the report highlights biodiversity loss and ecosystem collapse, critical changes in terrestrial systems, natural resource scarcity (including water), and pollution.

The debate around water at risk is not a purely local or regional issue, although the specific concerns surrounding this valuable natural resource vary across countries and continents (Schiermeier, 2014).

While international law has attempted to provide responses for better water governance—and has taken modest steps toward recognizing water as a human right—most concrete developments have emerged from domestic legal systems (Gupta, & Pahl-Wostl, 2013). States often legislate in response to local problems, and, in many cases, high courts have pioneered innovative approaches.

From severe droughts to intense flooding—both linked to climate variability—and from contamination of freshwater ecosystems to the deterioration of riverine environments, water-related challenges constitute a central dimension of the global triple planetary crisis (Seck, 2023).

Water management therefore faces a paradox: the heavy rainfall that devastates infrastructure and threatens survival in some countries could, in other regions, be key to saving lives or restoring habitability to territories across the world (Barbier, 2019).

2. Riverine Ecosystems at Risk

In both urban and rural settings, water plays a fundamental role in societal development—whether as potable water for human consumption or as the primary source of irrigation for crops (Dore, 2015). Yet population growth has exacerbated pressures on water systems: expanding urban footprints drive land-use change in rural areas, resulting in biodiversity loss and degradation of natural landscapes.

In addition, unplanned urban growth in developing countries often forces residents to rely on limited or inadequate infrastructure, generating public health problems (Halder, & Islam, 2015,. Water pollution and its impact on the human health. Journal of environment and human, 2(1), 36-46.) problems and contributing to the pollution of riverine ecosystems such as rivers, streams, lakes, and creeks.

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In response, citizens and civil society organizations have mobilized to demand action from cities and the State (Martínez-Moscoso & Warner, 2025).

Although there are notable examples of successful ecological recovery—such as the Rouge River in the United States (Macaraig, 2015) or the estuary in Bilbao, Spain—judicial actions demanding "the right to swim again in our rivers," (Moles & Olive, 2025) a claim linked to the broader concept of the right to the city, have become increasingly common. The 2024 Olympic Games in Paris provided a powerful illustration: the Seine River, long considered too polluted for public use, was integrated as part of the sporting setting (Yu, 2025).

Ultimately, restoring these spaces as healthy public environments is essential for ensuring the right to health and a clean environment.

Elsewhere, legal responses have taken different forms. To improve water quality and repair ecosystems, several jurisdictions have recognized riverine and related ecosystems as legal entities. Examples include the Whanganui River in New Zealand (Hutchison, 2014), the Atrato River in Colombia (Wesche, 2021)., the Marañón River in Peru (Gomero, 2024), the Mar Menor lagoon in Spain (Krämer, 2023), and the Monjas River in Ecuador (Martinez-Moscoso & Warner, 2025).

3. Current Concerns

For 2025, the *World Economic Forum* identifies pollution among the ten most alarming global risks (Elsner, Atkinson & Zahidi, 2025). Water pollution, in particular, presents acute challenges—such as contamination from PFAS (per- and polyfluoroalkyl substances), commonly known as "forever chemicals." Other water-related dangers include severe floods and droughts (Mussabek et al, 2022).

Since 2008, the UN Human Rights Council has mandated a Special Rapporteur to conduct thematic research, undertake country visits, and assess compliance with human rights to water and sanitation (Heller et al, 2020). In the Rapporteur's two most recent reports, special emphasis was placed on achieving harmony between water and the economy—managing the resources in ways that respond to human rights demands. The reports also address the nexus between water and food, highlighting the vast amounts of water required for agricultural production (Molajou, 2023) and the need for governance strategies that support agroecological transitions in the face of climate change.

4. Water in Times of War

The Russian invasion of Ukraine represents not only one of the most severe contemporary humanitarian crises—marked by civilian casualties, injuries, and millions of displaced people (Grzebyk, 2021) —but also a significant environmental catastrophe, with profound impacts on air quality, water systems, and biodiversity.

An article published in *Science of The Total Environment* reports that bombings of industrial and commercial infrastructure have caused widespread contamination of water sources (Pereira et al, 2022). This is compounded by water scarcity and inadequate sanitation due to the destruction of urban areas. Each attack results not only in physical destruction but also in deteriorating air quality and increased risks of radioactive leaks.

Some military operations have involved intentional forest fires, which accelerate deforestation and biodiversity loss. These realities have reignited debates around reforming the Rome Statute—the foundational treaty of the International Criminal Court—through the possible inclusion of a new offense: *ecocide* (Gray, 2017). The concept, used by scholars since the Vietnam War, refers to "mass damage and destruction of ecosystems: severe harm to nature that is widespread or long-term."

Regarding freshwater resources specifically, experts warn that military activities—such as troop deployment and trench construction—are damaging one of the world's most fertile soils, Chernozem. This threatens global food security (Ukraine produces roughly 50% of global

sunflower oil and 10% of global wheat) and limits access to clean water, with direct consequences for human health (Shumilova et al, 2023).

According to *Nature*, most of Ukraine's water infrastructure—dams, reservoirs, and distribution canals—is located in the eastern and southern regions currently occupied by Russian forces (Pereira et al, 2022). The publication cautions that contamination from Ukrainian water bodies may spread through transboundary basins and reach the Black, Azov, and Baltic Seas.

Although environmental impacts may appear secondary when compared to human suffering and physical destruction, they are deeply interconnected with human health, biodiversity preservation, and ecosystem protection. This underscores the need for immediate international action.

5. Shared Waters – A Governance Imperative

More than 40% of the global population lives within transboundary basins, meaning that portions of their national borders are formed or traversed by shared water bodies—rivers, lakes, and aquifers (Gander, 2014).

In South America, 60% of the continent's territory lies within international basins, totaling 38 shared watersheds. In the specific case of Ecuador—the country of publication of this Special Issue—transboundary basins are shared with Colombia (Mira, Mataje, and Carchi-Guáitara) and with Peru (Zarumilla, Puyango–Tumbes, Catamayo–Chira, Mayo–Chinchipe, Santiago, Morona, Pastaza, Conambo–Tigre, and Napo).

Within this context, Water Law includes a specialized branch: International Water Law, which governs cooperation between States for the integrated management of shared river basins.

Globally, the leading international agreements in this field include the *Convention on the Protection and Use of Transboundary Watercourses and International Lakes* and the *UN Convention on the Law of the Non-Navigational Uses of International Watercourses*.

Although regulatory progress has been made through these instruments, institutional strengthening is urgently needed. Transboundary water commissions must be equipped to articulate shared concerns and channel the needs and perspectives of all stakeholders living in these basins. This requires long-term planning insulated from political fluctuations, with academia and civil society organizations serving as essential strategic partners.

6. Presentation of the Special Issue

In an ever-changing world, where technological advances are multiplying at a breathtaking pace, sustainable, rational water management is becoming a major challenge.

The 21st century is marked not only by the growing importance of this challenge, but also by a diversification of approaches to meeting it. International law is far from being the only tool. Numerous laws and policies operate at the level of states, regions and other local authorities. The various *ad hoc* legal solutions take into account the local dimension of problems and cultural contexts, as well as the particularities of the legal systems in which they operate.

This plurality of approaches raises a number of key questions. Are there any ideas that seem so effective that they could be used on a larger scale? If so, does the fact that they are specific prevent them from being generalized? Are they not likely to be rejected as "legal graft"?

Providing a comparative overview of these contemporary challenges, shared by almost all communities, was the main aim of the international symposium entitled "Is water a risk?" organized on November 14, 2024, at the University de Haute Alsace (Mulhouse, France) by the European Risk Research Center, Collective Accident and Disaster Law.

Bringing together speakers from four corners of the globe, this scientific event provided a forum for debate on the understanding and governance of water-related risks, on the one hand,

and issues relating to water use and quality, on the other. Not only are these challenges deeply intertwined, but they also provide a good reference point for the diversity of possible solutions and contribute to the emergence of universal concepts.

The present book is a follow-up to this event, bringing together contributions presenting a current, interdisciplinary panorama of opinions on these issues.

In particular, readers will find a reflection by Anthony Tardif on the specific nature of water-related damage in relation to the principles of French civil liability law.

Claire Joachim teases us about the local peculiarities of the water protection regime in the environmental code of the Loyalty Islands, part of New Caledonia, a collectivity with a special status under the French Constitution.

From the United States's perspective, Christopher Dalbom and Katherine Moreland provide a comparative analysis of the possibilities for mitigating water-related risks through integrated river basin management. In the same vein, Mark Davis provides his opinion on the impact of new technologies on the sustainability of water resources.

Loic Peyen assesses the relevance of legal solutions put in place in France to manage droughts and other risks induced by water shortages, as does Philippe Billet, who tackles the management of excess water.

Representing Swiss legal doctrine, Peter Jung unravels the nuances of private international law on transboundary water pollution.

Additionally, Thomass Schellenberger provides us with a summary report of the oral discussions held on the day of the conference. His cross-cutting contribution can be found in the reviews section.

Finally, this Special Issue seeks to capture the outstanding debates held during the Water Risk Symposium—debates that will remain engraved in marble and serve as a foundation for future reflections. This work, which we place in the hands of Iuris Dictio's readership, is the result of a Franco-Ecuadorian partnership between the University of Haute Alsace and the University of San Francisco de Quito.

The risks associated with water are immediate, interdisciplinary, and visible from diverse analytical, legal, scientific, and social perspectives. Their complexity confirms that no single approach can adequately address the multiple pressures affecting water security, quality, governance, and ecological integrity. For this reason, we warmly invite readers to engage with the contributions gathered in this Special Issue, which collectively offer a rich and nuanced understanding of contemporary water challenges and the innovative solutions emerging across different regions of the world.

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