



Water Science and Innovations for People and Planet



The Pontifical Academy of Sciences (PAS), in collaboration with international research partners, is convening the workshop on “Water Science and Innovations for People and Planet” to be held March 9-10, 2027, at the headquarter of PAS in Casina Pio IV in Vatican City. PAS has a track record of addressing water-related challenges (see [PAS events](#)).

This conference will focus explicitly on the science and innovation of water itself. Water lies at the center of today's interconnected climate, food and nutrition, health, and biodiversity crises. Freshwater systems have been pushed beyond their ecological limits, while governance and investment have failed to keep pace with mounting pressures. As a result, addressing the global water crises requires transformative advances in science, innovation, and institutions that place both people and ecosystems at the center.

The workshop will critically examine how advances in water science and innovation can better support people and environmental sustainability. Also, institutional and governance in the water sector will be addressed, which – together with persistent knowledge gaps and the limited agency of key water actors, including farmers and local communities – has contributed to chronic underinvestment, highly inequitable access to and use of water resources, and the accelerating degradation of freshwater ecosystems affecting all life.

To address these challenges, the workshop will bring together advanced water science with broader objectives of ‘People and Planet’, including people’s wellbeing and rights, poverty reduction opportunities, climate resilience and ecosystem health. Consistent with PAS's commitment to science diplomacy, the meeting will also provide a platform for identifying future research priorities and inform the post-2030 global agenda for water and sustainable

development.

Scientific discussions will span multiple scales and disciplines, including:

- Understanding and modelling hydrological cycles under climate change;
- Modelling regional and local water systems changes, including river basins, groundwater and coupled human-natural systems;
- Different states of water and water quality;
- Water and health linkages;
- Non-conventional water resources, water reuse, and water-efficient technologies; and
- Water rights, justice, governance, and institutional innovations.

The workshop will examine innovations spanning technological innovations and institutions, data science, including AI, and advanced approaches to modelling, monitoring and water management. Recognizing that water underpins every sector and living being, discussions will explicitly address the trade-offs, synergies, and unintended consequences of technological and institutional innovations across agriculture, energy, ecosystems, health, urban development, and industry.

By bringing together leading scientists, innovators, and policymakers, and practitioners from around the world, the workshop will foster critical discussions across disciplines and sectors to identify transformative pathways for advancing water science and innovation. The ultimate goal is to strengthen the scientific foundations, governance systems, and innovation pathways needed to protect water resources while enhancing resilience, human well-being, and environmental sustainability.