



Katedra za zmanjševanje tveganj ob vodnih ujmah

The celebration of the 50th Anniversary of the IHP UNESCO Side-event on June 12, 2025 UNESCO Headquarters, Paris, France

Workshop "From Scientific Frontiers to Water Action" Session: The Frontiers of Hydrological Sciences

WATER SCIENCE FOR RESILIENCE & SUSTAINABILITY

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Where we stand?



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Hydrological Sciences should be seen in a wider perspective:

- Integrating risk-informed social and spatial development can enhance <u>resilience</u> against the impacts of disasters and climate change.
- □ The role of Science & Technology & Innovation is indispensible in these regards.
- Climate and disaster resilience, risk awareness, communication and education for inclusive preparedness plus inclusive Multi-Hazard Early Warning Systems are needed for sustainable development. We need science contributions & technology development based on innovation every where in the DRR management cycle.
- One speaks about Sustainability-Resilience Nexus (see right)

 sectoral policies can be contradictory or at least they seem like that they should be aligned. What are the implications for waters in this regard? Where is water in this nexus?





Where we stand?

Hydrological Sciences should be seen in a wider perspective

- We should seek for synergies on water issues in international sustainability and resilience-related policy documents.
- □ For Science & Technology & Innovation field: we need to treat the real world problems with real world solutions.
- European Union just a few days ago adopted Water Resilience Strategy.
- Water Europe proposed a model for Water-Smart Society (see right).
- How can UNESCO IHP-IX Programme support these new policies on water resilience? Are we already aligned or do we need some new actions?



Where we stand?



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- □ We are observing, monitoring, studying, modelling our Earth (hydrological cycle, water use,...) producing a wealth of data (e.g. Risk Data Hub or Copernicus).
- Putting all these (big) data together means creating information that is then used to build knowledge gained through our understanding of the world around.
- Science is asked to create knowledge and forms science-based evidence to policy and decision makers to decide/take actions – they are empowered by being elected to make decisions for common well-being.
- □ To a large extent, (natural) disasters are occurring after our past decisions that reveals our vulnerability or lack of resilience – though, there is no absolute safety.
- Important part is precisely how knowledge should be or can be shared & conveyed to decision makers?
- Changing over governance by inclusion of (all relevant) stakeholders, combing top-down and bottom-up approach, using participatory governance at all levels.



Knowledge Management Cognitive Pyramid







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In Europe we work on enhancing resilience within the ResiliEnhance Program -Enhancing the Resilience to Disasters for Sustainable Development –

it is co-financed by the Friaul-Venezia Giulia region in Italy and the Central European Initiative with the strong support by the UNESCO Regional Office in Venice.

The core members are UNESCO water family members from the region of South East Europe (see map).

https://resilienhance.uniud.it/





Figure 3: The Disaster Risk Management Cycle.

Figure 2: The intersectoral safety approach. 👪



By the Courtesy of the UNESCO Chair on Intersectoral Safety for Disaster risk reduction and Resilience, University of Udine, Italy.







Where to go from here?



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Some personal thoughts what directions for water actions in near future may look like:

- □ Strengthening the position of water within the IPCC activities and their reports at least as a stand-alone chapter if not more we need to think how to raise visibility of water as a driving medium in 21st Century.
- Supporting the development of post Agenda 2030 Sustainable Development Goals envisioning 2030 2050 period and beyond, and securing the presence of water as one of the key elements.
- Being part of the developments for a new post-Sendai Framework for Disaster Risk Reduction envisioning
 2030 2050 period. Capacity building and education should stay an important part of DRR in new framework.
- Positioning water within the Sustainability Resilience Nexus that coordinates/interrelates the key international policies of the Paris Agreement, Agenda 2030 and Sendai Framework for Disaster Risk Reduction, especially beyond 2030.
- Strengthening the UNESCO water family (chairs, centres, networks, ...) in this transdisciplinary field of crosscutting issues of sustainability and resilience.
- For water issues and hydrological sciences we should take opportunities for cooperation among stakeholders

 such as IAHS <u>HELPING Hydrology Engaging Local People IN one Global world</u> program and its WGs 3.1
 <u>Strategic UN-Collaboration Group (SCG-Hydro)</u>. The multiangle perspectives and multifunctionality of
 hydrology is seen in the variety of priority areas and actions of the IHP-IX Programme.







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Some personal thoughts what directions for water actions in near future may look like:

- Resilience is not only about physical resilience of our built environment but it is also a state of our mind it is in our heads. That is why risk communication should not be a broadcast; it should be a conversation.
- We should use new technologies and tools as enablers of adaptation to climate crisis, urbanisation crisis, all different sorts of crisis (i.e. polycrisis), and sustainable development. Systemic risks should be studied.
- (Big) Data are essential to develop large language models as well as small language models. Their integrity and quality are therefore needed. AI is a helpful tool, but we should use it with a grain of salt.
- Complexity is envitable and is becoming even more complex with all the uncertainty and unknown unknowns.
- There are gaps in our data across disciplines, regions, scales, Could citizen science close some of these gaps or using new technologies is the right answer? What we need is thrust among stakeholders.
- Collected data should be interoperable, accessible, shared, using open networks to harvest many different data sources from population (including indigenous people & first nations), private and public sector.
- Green transition and digitalisation will impose large loads on global and local water resources.
- Better recognition of multisectorial approach and transdisciplinarity of hydrology and water science for the Sustainability – Resilience Nexus in the IHP-IX Programme is needed. We may focus selected parts of the activities within the IHP-IX Programme (2022 – 2029) towards these developing challenges.





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Questions?

Thank You for Your Attention !

