UNESCO’s Intergovernmental Hydrological Programme (IHP)

Phase Nine (IHP-IX)

Priority Area 1
“Scientific Research and Innovation”

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A feature/impression of this section (and possibly other sections as well)

• Usually, the way of writing and itemization tends to be “disasters”, “groundwater”, “scarcity”, “quality”, “ecohydrology”, “cryosphere”, ...

• In this document and in this section, however, sectionalism is rather minimized, and the description is made in a more holistic and overarching way or in a cross-cutting way.
Expected Outputs (excerpt)

1.1. Integration of citizen science in hydrological research promoted, ...
1.2. The interaction between human and water systems in line with socio-hydrology...
1.3. International scientific cooperation enhanced to address unsolved problems in hydrology, improving scientific understanding of hydrological cycles across river and aquifer basins.
1.4. Uncertainty in hydrological predictions and forecasting ... for better adaptive water management strategies.
1.5. for Integrated Water Resource Management (IWRM) ... ecohydrology re Nature based solutions search...
1.6. water quality and reducing water pollution.
1.7. the impacts of global change (including climate change) on river basins, aquifer systems, cryosphere and human settlements...
1.8. non-conventional water...
1.9. disasters such as flood and drought enhanced for timely forecasting.
1.10. New technologies....
Relation between this priority area and the Agenda 2030

• Link to SDGs 13, 6, 7, 9, 2, 1, and the UN Decade of Action (2020-2029) are mentioned.

Innovation and partnerships

• unprecedented tech-driven and big-data era for innovation, numerical models (hydro-informatics) of hydrology for simulation, assessment and forecasting, and new monitoring techniques.
Further research in hydrological cycles, ecohydrology and groundwater

- spatial homogeneity, heterogeneity, and scales in hydrological variables and fluxes
- harmonization of grey and green infrastructures to achieve sustainability

Reducing uncertainty in water management

- Variability in the hydrological cycle, including extremes such as floods and droughts
- Research on melting snow reserves, mountain glaciers, permafrost, and groundwater
Innovative techniques for addressing water quality, involving **social sciences**

- Socio-hydrology. Human-Nature.
- “co-innovation” and “co-design”
- Water quality as an example.

**Innovation and use of technologies**

- ICT, AI, cubesats (nano-satellites), IoT, new sensors, data assimilation...
- impacting efficient and effective use of water resources, and reducing disaster risks.
Improving Citizen Science

• Using citizen science inputs provides new opportunities for society, like water awareness, ..., and pro-active support.

• From a science perspective, citizen science widens spatial and temporal data collection possibilities.

Accurate and adequate monitoring

• Accurate and adequate monitoring of hydrological systems is still lacking in many parts of the world

• scientists generally protected their data; but, today transparency...