Priority Area 1.

Scientific research and innovation

By 2029, the Member States have the knowledge, sound scientific and research capacity, new and improved technologies, and the management skills that allow them to secure water resources for human consumption and the maintenance of the balance of ecosystems within a sustainable development context.

Shinjiro Kanae, representative of Region IV
Priority Area 1: Scientific research and innovation

Expected outputs

1. **International scientific cooperation strengthened and fostered to address unsolved problems* in hydrology, improving scientific understanding of hydrological cycles across river basins and aquifers.**

(*Blöschl et al. Twenty-three unsolved problems in hydrology (UPH) – a community perspective. HYDROLOGICAL SCIENCES JOURNAL 2019, VOL. 64, NO. 10, 1141–1158. *)

To all hydrologists of the world: A Call to Arms!

What are the 23 unsolved problems in Hydrology that would revolutionise research in the 21st century?

To make tangible progress, the problems should

- relate to observed **phenomena** (Why do they happen?)
- should be **universal** (not only apply to one region)
- should be **specific** (so they can be solved)

https://iahs.info/IAHS-UPH.do
2. **Ecohydrology** research and innovation at UNESCO-designated sites conducted and shared by the scientific community and UNESCO Water Family, communicated to assess the impact of NBS on water cycles and include such solutions in Integrated Water Resource Management (IWRM) and services at all scales and in Sites’ management.
Priority Area 1: Scientific research and innovation

Expected outputs

3. Research on **uncertainty in climatic scenarios, hydrological projections and water use scenarios** conducted and recommendations communicated to decision makers and the general public to elaborate adaptive water management strategies.

4. Conducting scientific research on the exploration of new business models, the role of water utilities, broadening engagement and partnerships, and infrastructure by the scientific community supported to accelerate the **circular economy** transition of the water sector.

Oki and Kanae (Science, 2006)
Priority Area 1: Scientific research and innovation

Expected outputs

5. **Undertaking and sharing assessments on the interaction between humans and water, in line with socio-hydrology** by the scientific community supported to develop adaptive pathways, scenarios and strategies for water management.

6. **Scientific knowledge, methodologies and tools in addressing water-related disasters, such as flood and drought** elaborated and/or enhanced towards timely forecasting.
Priority Area 1: Scientific research and innovation

Expected outputs

7. Development and sharing of knowledge-base on the impacts of global change and human usage on river basins, aquifer systems, coastal areas, cryosphere and human settlements by the scientific community supported so as to embed it in water resources and services management plans.

8. Development and sharing of knowledge and innovative solutions on improving water quality, and reducing water pollution by the scientific community supported and communicated to support science-based decision-making, improve knowledge, services and reduce health related risks

https://groundwaterportal.net/
Expected outputs

9. **Development and sharing of new technologies using, EO (Earth Observation), AI and IoT by the scientific community and service providers are communicated to and/or used for capacity strengthening of water stakeholders to increase their use in hydrological planning and assessment as well as monitoring and distribution networks.**

10. **Conducting and sharing of research on integrating citizen science in the hydrological discipline by the scientific community and other stakeholders supported, to improve understanding of the water cycle enabling science-based decision.**

https://www.citizenscience.org/

JAXA/EORC
Priority Area 1: Scientific research and innovation

**ROLE OF UNESCO**

*Leading* science, research and innovation in cooperation with other UN Agencies and scientific partners

- Provide *leadership* in advancing actionable scientific research and innovation for addressing complex interlinked water challenges
- Promote *scientific cooperation and building partnerships* with other UN organizations, professional scientific organizations and other international scientific water programmes.
- Continue *partner with academic institutions and research centres* in developing research initiatives, validating results and disseminating these results to Member States.
- Continue to broaden and deepen different collaboration and coordination strategies, working on interfaces between hydrology and other disciplines