

Co-Creating Water Knowledge: A Transdisciplinary Framework for Finding Solutions to Challenges of Hydrology and Water Management in the Anthropocene

Working Group on Co-Creating Water Knowledge*, International Association of Hydrological Sciences (IAHS)
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Join us: <https://iahs.info/Initiatives/Scientific-Decades/helping-working-groups/co-creating-water-knowledge/> →

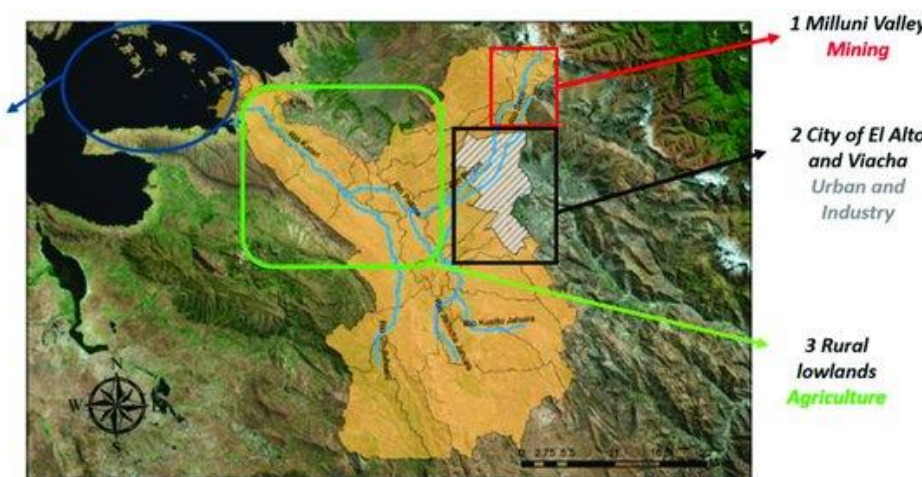


Complexity of water problems and water injustices require knowledge CO-CREATION:

- ❑ Provides unique insights on the local hydrology, water management, and the socio-cultural context.
- ❑ Provides comprehensive and adaptive solutions needed to tackle these multifaceted challenges effectively and with justice.

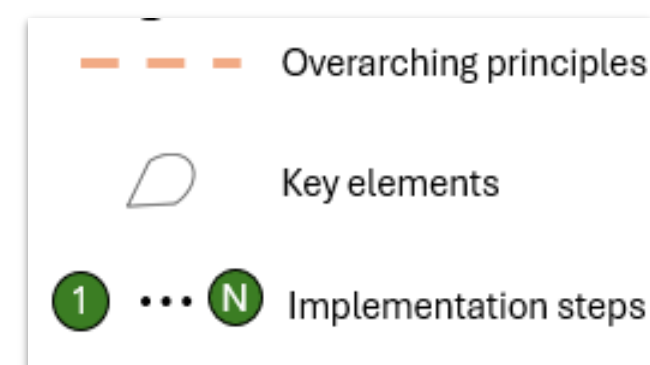
Co-creation of water knowledge (CCWK)

is a collaborative process where diverse stakeholders—including scientists, local communities, and policymakers—jointly generate and apply knowledge to tackle water-related challenges by integrating scientific research with local insights.



Early, ongoing integration of scientific and local knowledge, facilitated by iterative evaluation, reflexive dialogue, and adaptation; this approach ensures that outputs are meaningful, accessible, and actionable across diverse knowledge bases, fostering lasting social and environmental change in water management.
 i.e., **Water quality citizen science to promote environmental justice in an indigenous community in Lake Titicaca, Bolivia**⁵

Concept



We conceptualize CCWK as encircled by 4 overarching principles (i.e., **Living Dikes: nature-based flood protection in the Netherlands**¹), evolving along a cyclical set of implementation steps (green, the number and nature of these defined by the specific context), but consisting of approaches falling into four key cornerstone elements (unfolding petals).



Including system mapping, scenario analysis, stakeholder mapping, and creative methods to foster mutual understanding and envision actionable solutions collaboratively,
 i.e., **“Grow with the Flow”: co-development of an integral monitoring and forecasting platform**⁴

Research questions that affect communities and non-scientific actors.

Ensures that all parties are represented and benefit from the co-creation process.

Vision for the Future

- **Global Standardization:** By 2032, we aim to establish a global standard for best practices in water management co-creation, integrating diverse stakeholder contributions to enhance effectiveness and equity.
- **Inclusive Governance:** We envision strengthened water governance through inclusive and participatory frameworks that foster resilience, sustainability, and equity in addressing water-related challenges.
- **Overcoming Barriers:** We commit to identifying and addressing epistemological, structural, and procedural barriers that hinder co-creation efforts, ensuring broad application and sustainability of solutions.
- **Institutionalizing Co-Creation:** We seek to institutionalize co-creation as a fundamental practice within water management policies and frameworks, promoting epistemic justice and valuing all forms of knowledge to enrich the decision-making process.

Fosters shared understanding, mutual respect, and co-defined objectives, ensuring that all perspectives—especially marginalized ones—are represented and valued, i.e., **Floating treatment wetlands for urban pollution remediation in Bangladesh, India, and Nepal**²



Further Reading

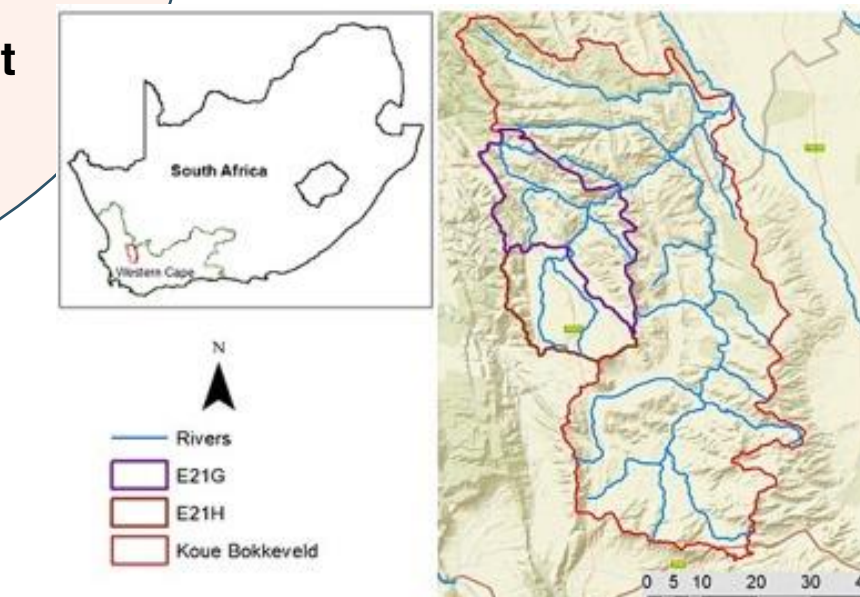
- Arheimer et al., 2024. The IAHS Science for Solutions decade, with Hydrology Engaging Local People IN one Global world (HELPING). *Hydrological Sciences Journal*, 69, NO. 11, 1417–1435.
- Carroll et al., 2020. The CARE Principles for Indigenous Data Governance. *Data Science Journal*, 19, 43.
- Norström et al., 2020. Principles for knowledge co-production in sustainability research. *Nature Sustainability*, 3(3), 182–190.
- Rangelcroft et al., 2021 Guiding principles for hydrologists conducting interdisciplinary research and fieldwork with participants. *Hydrological Sciences Journal*, 66(2), 214–225.

Case studies

1. TU Delft, <https://www.tudelft.nl/en/2023/tbm/climate-proof-coastal-protection-with-living-dikes>
2. The Small Earth Nepal. 2014, May 4. <https://smallearth.org.np/activities/successfully-completed-ftws-rafts-installation-in-nagdaha-nepal/>
3. Gwapedza et al., 2024. *J. of Hydr.*, 639, 131522
4. DEL111 - TKI Projects - Deltares Public Wiki. <https://publicwiki.deltares.nl/display/TKIP/DEL111+-+Grow+with+the+Flow>
5. Agramont Akiyama et al., 2022. *Water International*, 47(1), 8–29.
6. More on the IAHS Digital Water Globe: <https://iahs.info/Initiatives/digital-water-globe/>

The need to foster an open, trusting, pro-development, encouraging, and creative atmosphere.

Facilitates open dialogue and shared goals, promotes inclusive participation and collaboration, prioritizes well-being, deconstruction of hierarchies, and fosters a collective sense of purpose among stakeholders, i.e., **A stakeholder-driven co-development of an equitable water resources management plan in the Western Cape, South Africa**³



*Anahi Ocampo-Melgar, Eduardo Mario Mendiondo, Ben Howard, Subhabrata Panda, Maria Rusca, Pedro Alencar, Leon Hermans, Britta Hölleremann, Moctar Dembele, Anandharuban Panchanathan, Rodolfo Nobrega, Mohammad Merheb, Tanveer Adyel, Stefan Krause, Luna Bharati, Gil Mahe, Kalpana Chaudhari, Afua Owusu, Afnan Agramont, Aster Hordofa, Meriam Lahsaini, Salvatore Manfreda, Christophe Cudennec, Amobichukwu Amanambu, Adeyemi Olusola, Lydia Cumiskey, Dhiraj Pradhananga, David Gwapedza, Gordon Gilja, Fardous Zarif, Ahmed Elshenawy, Rajendran Shobha Ajin, Fernando Jaramillo, Cristina Caramiello, Caitlyn Hall, Hasnat Aslam, Hamouda Dakhloui, David Walker, Seifeddine Jomaa, Peter Chiffard, Daniela Trimi-Chiffard, Franciele Maria Vanelli, Lorenzo Villani, Tommaso Pacetti, Luigi Piemontese, Elena Bresci, Sazzad Hossain, Wouter Buytaert, Giulio Castelli