

The next great water crisis may be under our feet

By [Karen G. Villholth](#)

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Every day we awaken to new headlines depicting a world in crisis: storms, floods, droughts, refugees, diplomatic conflict, war. As we move deeper into an era of climate unpredictability, pollution and resource scarcity, they increasingly have one thing in common: they are water-related. And among the most challenging of these may be a water source we rarely think about: the groundwater beneath our feet.



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Access to groundwater is a vital part of feeding the world's growing population. Around 44% of irrigated food production worldwide uses groundwater as a water source. And as surface water becomes more scarce or polluted, agriculture will demand more and more groundwater.

Groundwater is out of sight - stored and transmitted in cracks and pores and other open spaces in the subsurface - so-called aquifers. But it is becoming top of mind for decision-makers - especially since it has no regard for political borders. Groundwater needs to be part of the solution for the growing scourge of drought. We watch as Cape Town struggles with severe drought due to poorly aligned coping strategies. However, now, groundwater is coming into play to ameliorate the scarcity faced by residents. And likely, it will serve as one of the major saviours for these water-stressed communities.

However, imagine the fallout of a prolonged rainfall shortage in an area without groundwater. This is the recipe for mass migration of people, potential conflicts and far-reaching knock-on effects. We have already seen refugee and political hotspots enflamed by water crises in the Middle East. But we have barely encountered the tip of the iceberg. The rest of the iceberg is not frozen water, but depleted aquifers. This phenomenon is spreading across dry regions of the earth.

Countries in the Middle East, Northern Africa, South and Eastern Asia - including prominent countries like India and China - have already overdrawn their water security accounts. There is no longer enough groundwater to shoulder future droughts. Jeopardised food security could be the domino effect. These countries are increasingly vulnerable to climate change and are only now realising how ill-prepared they are for the challenges.

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Sound water governance is key

Key to avoiding the worst of a crisis is sound water governance, particularly as it relates to groundwater. If, with little foresight, we deplete or destroy our groundwater resources due to governance structures that do not explicitly aim to sustain it, societies may be undermined. Syria is a clear example.

A new book on *Advances in Groundwater Governance* asserts that we have made some progress in terms of addressing governance for the sustainable use of groundwater. But for the long-term resilience of communities in vulnerable areas around the world, we need to do much more.

To protect our water future, we need close collaboration between groundwater users and designated water authorities with clear and transparent roles and long-term planning and monitoring of resources, the environment and compliance with regulations. It is also crucial to support transboundary and international cooperation on groundwater management and capacity development. Governments and others need to work together to protect aquifers - and to avoid or mitigate potential conflicts over access to water.

Decision-makers also need to integrate governance of all water resources into planning, to make sure each resource is optimally available for use by the public sector, communities and businesses, but without risking long-term damage. This includes enhancing groundwater storage during floods while making it available during droughts - to sustain the water security account. Smart technology options (such as smart card machines installed on wells to control groundwater abstraction) and codes of practice for transparent borehole drilling also need to be integrated into collaborative governance structures. And the indirect drivers of groundwater use, like food production and energy generation need to be part of the equation, to get the governance right.

Solutions need to be rooted in the social fabric

Groundwater, while a crucial hub for water security cannot be seen in isolation. And solutions need to be rooted in the social fabric. What works in China may not work in India, for example.

Politicians, governments, businesses, farmers and the public need to engage in this now. Groundwater cannot be governed solely by a top-down approach. We need our leaders - and society at large - to take seriously the governance of our degrading, but crucial 'last frontier' natural water resource.

If we fail to consider this urgently, the world can expect a future of serious groundwater-fed crises.

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