

World's shrinking groundwater 'needs better governance'

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An eminent Australian water scientist has urged the world to take better care of its groundwater resources – or risk dangerous scarcities, economic impacts and potential conflicts in coming decades.

Professor Craig Simmons, the Director of Australia's National Centre for Groundwater Research and Training (NGCRT) says that governments around the world need to get behind the UNESCO plan to develop a Global Framework for Action on [groundwater](#) governance, due for release shortly.

"Groundwater governance may sound like a dry argument to some people – but it's a life-and-death issue for millions. It also affects the ability of countries like China and India to continue to grow their economies and to feed three billion people. And, since water scarcity is sometimes a trigger for conflict, it also holds the key to a more peaceful world."

Groundwater makes up 97 per cent of the world's available fresh water. Total global use is estimated by scientists at around 1000 cubic kilometres a year, with the largest users being India, China and the USA. Since 1900, the world has drawn down its [groundwater reserves](#) by an estimated 4500 cubic kilometres – and demand continues to increase, especially in arid countries, which are rapidly running short of water that can be affordably extracted.

"A significant part of the world's food supply depends on groundwater –

which is already starting to run short in critical regions such as the western USA, Mexico, northwestern Sahara, Indus Basin and North China Plain," Professor Simmons says. "This is something every consumer should be concerned about, as it affects global food prices."

"Australia has been a significant contributor to the UNESCO discussions on developing a global action plan to protect this imperilled resource. Furthermore, with the work done to cap bores in the Great Artesian Basin, we are one of the very few countries in the world to have launched a successful bid to reverse a decline in a major groundwater resource."

Professor Simmons says that [groundwater supplies](#) around 30 per cent of all the freshwater used in Asia – and if it runs short, could threaten food security, economic growth and many huge cities. "The countries where this is happening are keenly aware of the risks – but this is not a simple issue to resolve: you can't just turn off the tap."

Hence, he says, the need for better governance of groundwater – and the rapid global sharing of best practices, good laws and regulations, effective policy options, ideas, advanced technologies and greater public awareness.

"Asia – especially south Asia – and the nations of the Pacific South Asia face major challenges to meet their growing demand for water, at a time when the resource itself is under increasing stress. The unplanned and massive use of groundwater in the last thirty years has resulted in serious and growing problems of depletion through over abstraction and groundwater pollution, from man-made chemicals, arsenic or salinity.

"Also, in a region subject to a growing impact from natural disasters, groundwater represents a vital reserve of fresh water which is essential for post-disaster recovery.

"Much economic and population growth is generated in coastal and flood-prone areas of the Asia-Pacific and many small island states are especially vulnerable, as rising sea levels threaten their freshwater aquifers."

"All round the world, especially beneath the great cities, groundwater faces a sustained deterioration in quality due to human activities which use ever-increasing amounts of toxic chemicals, many of which leach from landfills and industrial sites into aquifers used by city people for drinking water. UNESCO has warned that, because groundwater usually moves very slowly, [groundwater pollution](#) is almost irreversible, or at least, very persistent."

Professor Simmons says Australia has a great deal to contribute towards improving the world's groundwater governance. "In the Great Artesian basin we have demonstrated one of the rare cases of conserving and improving water resources in a massive groundwater basin by capping uncapped free-flowing bores to restore water pressure in the basin and protect the health of important groundwater-dependent ecosystems and springs.

"Similarly, in the Murray Darling Basin we have established one of the world's most effective water management systems for a large river basin – where one of the big issues is managing water across different boundaries and jurisdictions. And we have demonstrated the practicality of managed aquifer recharge – or water banking – to replenish groundwater during wet times.

"Among our most important contribution to world groundwater science is the work we are now doing in modelling and predicting the behaviour of aquifers under varying conditions and developing state of the art methods for measuring, modelling and monitoring groundwater. This is an absolutely essential platform for any form of effective governance.

You have to know what you've got and be able to forecast future changes - especially under climate change - in order to manage it well."

Provided by National Centre for Groundwater Research and Training

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