Underground dams 'can help drought-proof the Basin'

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Underground dams offer a promising way to make Australia's number one foodbowl, the Murray-Darling Basin more resilient against droughts, a leading water scientist says.

Professor Tony Jakeman of the National Centre for Groundwater Research and Training and the Australian National University says his group's research in the Namoi River region of NSW shows there is good potential to store water underground during time of flood – for use in time of drought.

"It's a chance to turn 'a land of drought and flooding rains' into one that stores and uses its water endowment far more wisely," he says.

The team's research also indicates it may be cheaper to store water in buried aquifers rather than in surface dams, which suffer from heavy evaporative losses as well as high construction costs, Prof. Jakeman adds.

Furthermore their research has found strong support among the farming community for further testing of the 'underground dams' concept for use on individual farms, as well as scope for local or regional water saving.

The findings may be timely. The Australian Bureau of Meteorology recently issued an alert saying there is a 70 per cent chance of a new El Nino event, the first since the end of the Millennium Drought: www.bom.gov.au/climate/enso/

"The Murray-Darling Basin (MDB) covers a seventh of the continent, is the nation's main food bowl, and has nationally and internationally significant natural and cultural assets. Its water resources are under particular pressure due to over-extraction of surface flows in some areas, barriers to connectivity, declines in water quality and the depletion of aquifers," Prof. Jakeman says.

"However our research indicates there is an opportunity to rectify some of these challenges with the use of managed aquifer recharge (MAR), or water banking as it is sometimes called."

He adds "Our view is that we could benefit from more innovative options which manage surface and groundwater use together, such as managed aquifer recharge."

Prof Jakeman says the work by NCGRT in the Namoi has shown that managed aquifer recharge may be feasible at farm scale, and potentially at regional scale, that it is cost effective and that the idea of storing water underground enjoys broad community support.

"So long as you have surplus water which you could pull out of streams or rivers when there is plenty – for instance during a flood – and you have suitable aquifers to hold it, as well as suitable conditions on the surface to get it into the aquifer, then water banking should be seriously considered as an option."

Getting the water into the aquifer is usually achieved either by building a 'soak' – a depression built on suitably permeable soils which holds water until it leaches down into the aquifer – or else by injecting it with a pump (either solar or electrical powered). The first option is generally cheapest, he says, but depends on the suitability of the landscape.

Water banking can be adopted at farm scale, in volumes suitable for

supplementing irrigation supplies in a dry season – but it can also potentially be used to store water for towns, cities and industrial uses.

"The work was done in the Namoi region, and shows there is excellent potential for managed aquifer recharge there. But the principles apply right across Australia – wherever there are rivers that flood, suitable aquifers and communities or industries which need water."

The Namoi work is an important demonstration of the potential for establishing a National Water Bank, the Director of NCGRT, Professor Craig Simmons says.

Prof. Simmons recently issued a national call for governments at all levels and water users to consider creating a National Water Bank to ensure Australia need never run short of water in future.
www.groundwater.com.au/news_it … -water-bank-proposed

The National Water Bank concept involves a monitored network of underground and surface resources that use underground aquifers to store water, with the advantage that underground storage reduces both large evaporative losses and infrastructure costs compared to reservoirs and dams.

"Professor Jakeman and his team have provided invaluable practical proof of the concept of Australia storing substantial amounts of surplus water underground in an area which is strongly reliant on water for agricultural production. This complements other scientific research in places such as Adelaide and Perth which has shown its potential for city use.

"It adds up to a major case for Australia taking the idea of water banking in underground aquifers far more seriously. This is the sort of infrastructure development that will meet the needs of a growing nation

with growing industries far into the future."

Provided by National Centre for Groundwater Research and Training