



focus on **WATER** research

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Managed aquifer recharge: for improved cotton water productivity

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What are you researching?

This project is investigating the potential to implement Managed Aquifer Recharge (MAR) in the irrigated cotton growing regions of Australia, evaluating its feasibility across all facets (ie. financial, economic, technical, legislative, social and environmental).

MAR is the purposeful recharge of aquifers using surface water, which may be extracted at a later date. We are conducting detailed investigations in the Murrumbidgee, Namoi and Gilbert catchments across all facets of feasibility.

The Murrumbidgee and Namoi catchment show potential for MAR because of their high yielding aquifers with storage capacity for additional water. While the Gilbert region, an emerging cotton growing region, faces challenges for storing water above ground, so MAR may provide an option to underpin an irrigated industry.

Focusing on regions enables us to better refine our analysis and results, such as for the MAR cost values given below.

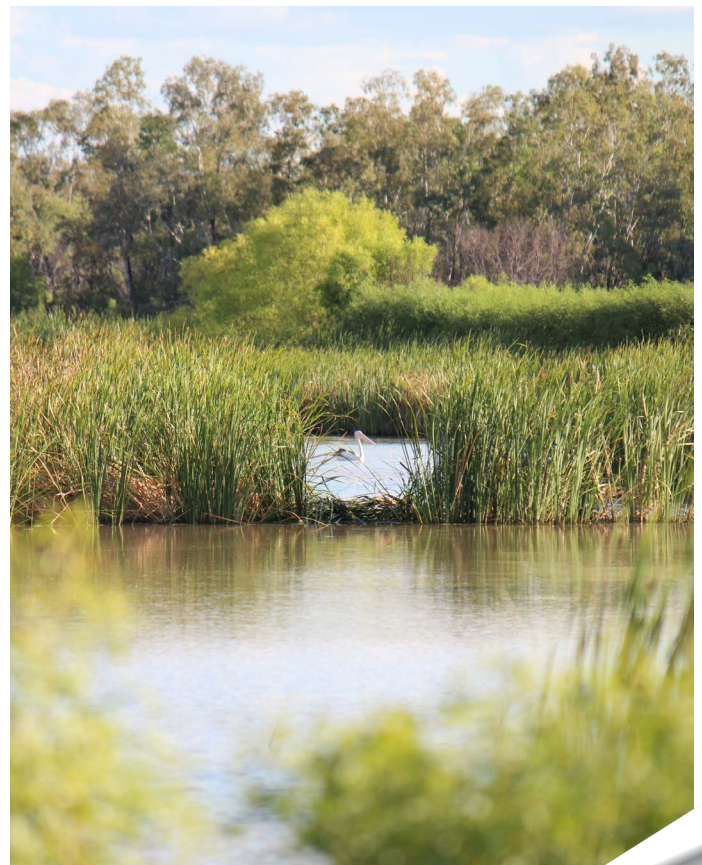
What have you found?

To date we have used MAR costs from research and existing MAR schemes to identify their potential range under different circumstances throughout Australia.

Infiltration basins can be used to recharge water if aquifers are permeable and shallow, but if the infiltration rates are low, the aquifer is confined or at depth, or there is a saline shallow aquifer near the surface, injection wells might be required. The capital, maintenance and operational costs vary between infiltration basins and injection wells, as well as with water quality, while

groundwater pumping costs are cheaper in higher yielding aquifers.

Existing surface water entitlement, or additional water bought through the trade market can be 'banked', and between 80 to 100 per cent of that water can be extracted, depending on the aquifer material, water quality and applicable policies. Note that generally current water policies still need to be updated to be better enable MAR schemes.



Financially, MAR has the greatest potential in regions with a highly permeable aquifer close to the surface, for people with a supplementary entitlement, or access to cheap surface water on the trade market. Infiltration basins recharged with supplementary entitlement provided the cheapest MAR scheme at \$95/ML of water recovered. Buying and ‘banking’ surface water when it is cheap can achieve a comparable MAR cost. Using injection wells for recharge is generally more expensive, with the cheapest well option costing \$247/ML of water recovered.

Why is it important?

Water security has become a key limiting factor in the profitability of the cotton industry. MAR offers an option to attain surface water when it is abundant and store it underground (ie. ‘bank it’), therefore avoiding evaporative losses that can be experienced when storing water above ground.

A MAR water supply can even out the peaks and troughs, leading to greater security and certainty. However, MAR systems can be expensive to implement, with infrastructure requirements and costs being highly dependent on local conditions.

Where do I go for more information?

If you are interested in learning more about the project, particularly if you live in one of the case study regions, please contact Wendy Merritt: 02 6125 7762, Wendy.Merritt@anu.edu.au.

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Australian National University

Estimated costs for rural MAR schemes in Australia

