

# Impact Case Study

## Improving Water Markets and Trading through New Digital Technologies

### Introduction and background

Fair and effective access to water for communities and industry is an increasingly complex issue. Large-scale water users, such as Australia's agricultural industries, need transparent and cost-effective markets to trade water rights.

Australian water markets have grown quickly since the late 20th century, and the Australian Bureau of Meteorology reported a \$7 billion market turnover in 2019-20.

To ensure that water rights and water markets continue to improve – by reducing costs, and being more efficient and transparent – RMIT's Blockchain Innovation Hub collaborated with a range of partners to pilot a project using the latest digital technologies for agricultural irrigators in far north Queensland.

Blockchain systems, in which transactions are securely recorded and linked across several networked computers, are not only used for Bitcoin and other cryptocurrencies. Secure blockchain systems can also be used for activities as diverse as gaming, creative industries and logistics.

The Improving Water Markets and Trading through New Digital Technologies pilot program explored the use of blockchains to improve trading in water markets, through a platform called Water Ledger.

Water Ledger was developed by blockchain company and research partner, Civic Ledger. The blockchain-enabled peer-to-peer water market and trading platform allows the system to provide top-level pricing data about trades to the public, while maintaining the confidentiality of the underlying financial transactions.

### The research

At RMIT, project leader Dr Darcy Allen and researchers Dr Aaron Lane and Dr Elizabeth Morton investigated how to use Civic Ledger's Water Ledger platform in a pilot water trading project.

The Improving Water Markets and Trading through New Digital Technologies pilot project focused on agricultural irrigators operating within the Mareeba-Dimbulah Water Supply Scheme (MDWSS) on the Atherton Tablelands in Far North Queensland.

Water Ledger was adapted to the MDWSS business and operating rules. During its deployment, the project team examined how the latest blockchain and smart contract technology could address the three fundamental challenges for effective and efficient water markets:

- How to reduce transaction costs
- How to reduce transaction costs
- How to easily check real-time prices in the market
- How to ensure interoperability of different computer systems and software of the blockchain system.

This pilot project – a world first – was conducted from April 2020 to September 2020.

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What's next...

## Funding support and/or institutional support

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The Cooperative Research Centre for Developing Northern Australia (CRCNA) co-funded the pilot project in partnership with blockchain company, Civic Ledger. Total project funding was \$203,438, with RMIT and other partners providing in-kind support.

Other research support was provided by RMIT's Blockchain Innovation Hub, key research collaborator, Queensland water service provider SunWater, and the other project partners – Far North Queensland (FNQ) Growers, the Queensland Department of Natural Resources, Mines and Energy (QDNRME), and Griffith University.

## Project outcomes

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The final report for the Improving Water Markets and Trading through New Digital Technologies pilot project is available through CRCNA:

- <https://www.crcna.com.au/resources/publications/improving-water-markets-and-trading-through-new-digital-technologies>

The report concluded that:

*“...these next generation technologies offer significant opportunity to reduce transaction costs by reducing trading time from the current 60-90 days to less than a week. A significant element of this time reduction is public visibility of buy and sell offers, and automated approvals via smart contracts. However, as regulation develops to capture the benefits of blockchain directly there is potential for near real time approvals of water trades.”*

The report notes that further research and development is required, however, to address remaining issues around capturing market price details quickly, encoding business rules within smart contracts and improving interoperability between the water market and water delivery infrastructures.

### Government reports

The Senate Committee into Financial Technology and Regulatory Technology cited the project in its second interim report (p. 81):

- [https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Financial\\_Technology\\_and\\_Regulatory\\_Technology/FinancialRegulatoryTech/Second\\_Interim\\_Report](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Financial_Technology_and_Regulatory_Technology/FinancialRegulatoryTech/Second_Interim_Report)

### Media

The Australian Financial Review wrote about the project in May 2020:

- <https://www.afr.com/technology/asx-tech-behind-civic-ledger-s-water-trading-blockchain-20200512-p54s53>

Ledger Insights covered the project in May 2020:

- <https://www.ledgerinsights.com/water-ledger-blockchain-australian-government-civic-trading-water-rights/>

The Land covered it in June 2020:

- <https://www.theland.com.au/story/6809773/blockchain-applied-to-the-water-market/>

Senator Andrew Bragg mentioned the project in speech to Blockchain Week 2021:

- <https://www.andrewbragg.com/post/blockchain-australia-week>

The International Water Centre's YouTube channel includes a presentation by Civic Ledger's CEO and co-founder Katrina Donaghy discussing the project (at 2:30m):

- <https://www.youtube.com/watch?v=K8xEsS6SIVM>

## Overview of the impact

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The ongoing trial of the new system in Queensland comes as multiple government inquiries have called for a national, single platform to manage water resources.

An April 2021 Federal government report on the Murray Darling Basin called for “a single authoritative platform” to be created in order to collate information on water resources provided by various government bodies. Resources and Water Minister Keith Pitt has accepted this recommendation.

## Next steps

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Irrigators in the Atherton Tablelands continue to test the new Water Ledger platform to trade temporary water allocations. The trial will be of interest to policy makers seeking to improve transparency of water management in the Murray-Darling Basin.

All around Australia, managing water markets is both difficult and essential. The Improving Water Markets and Trading through New Digital Technologies pilot program provided essential data and industry feedback that can be applied in further research for optimising the Water Ledger platform. It may also become a model for the IT infrastructure needed to manage water markets all around the country.