



Mini-Symposium / Thematic Session 5

Role of market mechanisms in sustainable management of water

Australia is one of the most water stressed content. To manage this stress water markets have been widely adopted and implemented in Australia. These markets have generated substantial environmental, social and economic benefit. However, there are areas where the performance of water markets could be improved even further. In this symposium we present papers on advanced distributed ledger technology (DLT)-enabled water trading market, groundwater markets, urban water markets and market failure issues. Finally, experienced panellists will discuss the current trend and future direction of water markets in Australia and abroad.

Paper 1: Potential of Distributed Ledger Technology (DLT)-enabled water trading market

Anik Bhaduri, Md Sayed Iftekhar

The water market in Australia's Murray-Darling Basin is the world's largest system of water trading, with total worth of about \$1.5 billion per annum (ACCC, 2020). Despite the relatively large size of water markets, their full potential has not been materialized due to a lack of robust market mechanisms (ACCC, 2020). An appropriately designed Distributed Ledger Technology (DLT) has the potential to improve the performance of water markets. The objective of the study is to understand the potential of a DLT-enabled water trading market in terms of market performance, social welfare, and environmental improvement with a case study in Northern Queensland. The study analyses endogenous market structures and comparison of actions and outcomes from a DLT based Water trading platform (WTP), a currency market and non-market participation. Simulations using the WTP are conducted to attain equilibrium prices and quantities sold to better understand the boundary conditions for the functionality of both case study markets.

Paper 2: Economics of plantation forestry water allocations and cap and trade policy

Courtney Regan, Jeffery D Connor, Md Sayed Iftekhar

As global water scarcity grows, there is increasing discussion to address plantation forestry impacts on groundwater, surface water and dependent ecosystems. Recent regulation, in response to continuing declines in groundwater levels in the region in the SE of South Australia, on entitlements for water impacts of plantation forestry involve water plans require considerable reductions in forest

water entitlements in areas where groundwater has been most impacted by plantations. Conceptually, the policy governing plantation forest water impacts allows plantation owners to sell their water entitlements. Whilst water trading has significantly mitigated production, and economic impacts for irrigators who now have a three-decade history of water trade in the Murray-Darling Basin, for forest managers attempting to maintain revenues and timber flows, adapting to less water and tradeable water rights presents novel challenges. This presentation will explore how water-trade opportunities built into groundwater policy for plantation forest impacts can facilitate flexibility and adaptation and reduce compliance costs.

Paper 3: Performance of urban water market: A case study of Victoria

Md Sayed Iftexhar, Christian Urlich

Urban water supply will likely face challenges in an environment with changing climate and rapid population growth. The establishment of water markets has been identified as a key element to improve urban water security in Victoria, Australia. However, the potential performance of water markets has not been thoroughly explored. This paper contributes to knowledge gaps about potential urban water market performance by comparing two water management options: a decentralized option intended to facilitate trade in water resources, encourage the implementation of integrated water cycle management and alternative water sources; and a centralized option where a single planning authority is the mechanism through which water resources are allocated to meet urban water demands. An agent-based model combined with a water resource model developed to compare the options is presented.

Paper 4: Exploring the costs of water recovery in the Murray-Darling Basin by on and off-farm irrigation and supply infrastructure

Sarah Wheeler

Previous research has highlighted the relative difference between water recovery for environmental purposes in the Murray-Darling Basin by two main methods: 1) buying water entitlements off willing irrigators (Restoring the Balance program) and 2) subsidising on and off-farm irrigation infrastructure and transferring a portion of the supposed 'water savings' back to the Commonwealth (Sustainable Rural Water use and Infrastructure program). Cost differences were estimated to be up to over two times more expensive on nominal water costs per megalite (and this is ignoring any return flow issues) on infrastructure programs in 2018 (Grafton and Wheeler 2018), with costs expecting to increase given the halt on buying back water entitlements. This presentation will explore some preliminary analysis on the Commonwealth irrigation infrastructure program data, looking at trends over time, state, and programs, and ideas for future research.

Organisers:

Md Sayed Iftexhar, Griffith University

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Discussant:

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