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# ABSTRACT BOOK

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# CONFERENCE ABSTRACTS

## MODELLING WATER DEMAND AND TRADE ON THE MURRAY AND LOWER DARLING RIVERS

**ALAM Md Jahangir, BETHUNE Matthew, TOWNSEND Phil, CLOSE Andy**
Murray-Darling Basin Authority
*Poster Presentation*

The Murray–Darling Basin is one of the largest river systems in the world. It supports a large community and is ecologically diverse. The Basin Plan is being implemented to restore the balance between consumptive uses and environmental health in the Basin. The socio-economic implications are a critical consideration in any change to this balance. Under the Basin Plan, considerable effort was invested into understanding how irrigation communities will respond under different water availability/management scenarios. This paper builds on this understanding by enhancing modelling approaches used in water resource planning to represent how irrigator's behaviour may change in response to new water management rules.

The analysis uses a new demand model in the Source IMS river modelling platform. The amount of water available to an irrigator is the key modelled decision variable, impacting on crop areas and crop mix. The available water is dependent on carryover from last year, allocated water, planned trade of allocation and planned carryover into the next irrigation season. Prior to making a planting decision, the irrigator will review their water portfolio and make a decision on how much water they plan to trade (in or out) and how much water they plan to carry-over into the next season. The resulting available water is then used to make a decision on what area they will plant to different crop types each year. This logic represents the trading of water to support urban and permanent horticultural plantings in low allocation years. Conversely, allocation is traded to increase the area of annual cropping systems in years of high water availability. The irrigators water portfolio is reviewed as the season progresses. If they are likely to run out of water, a decision is made too either reduce irrigation intensity (ie go into survival mode), cut back the irrigated area or to buy additional water. Any surplus water could be sold. The approach is tested against available land use, water use and trade data on the Murray and Lower Darling rivers.

## WHAT LESSONS FROM TASMANIA - AUSTRALIA'S IRRIGATION FRONTIER?

**ALEXANDRA Jason[1], NELSON Rohan[2], RAE Mel[3]**
Alexandra & Associates[1], TIA[2], MacQuarrie Franklin[3]
*Oral Presentation – Session: A3C*

An estimated billion dollars is being invested in expanding irrigation in Australia's wettest state, Tasmania. While much public attention has focused on the northern Australian "irrigation frontier", this paper will examine recent lessons from Australia's southern "irrigation frontier" including the need for futures orientated, consultative planning and innovation partnerships to accompany investment in water resources infrastructure.

The Tasmanian and Australian governments have invested over $220 million in new infrastructure to expand irrigation. Farmers are committing a similar amount through the purchase of water entitlements and are also making multi-million dollar investments in on-farm irrigation infrastructure such as dams, pipes and application systems. More than 150 Giga-litres of new irrigation water will be available when planned schemes are fully operational. This adds about 20% to the total amount of water used for irrigation in Tasmania, a state where irrigation already accounts for approximately %60 of the gross value of agricultural production.

This 21st century roll out of new irrigation schemes provides significant risks and opportunities. How to avoid the historic problems that have plagued irrigation like salinisation, water logging and the over exploitation of rivers? The twin challenges of productivity and sustainability need to be planned and managed together.

This paper presents the findings of a foresighting and scenario-planning project funded by Tasmanian government. The project used scenarios and foresighting methods as the basis of consultative planning and identified the need for R&D focused on achieving more sustainable and prosperous futures for Tasmania. It found that R&D is needed to enhance the productivity and sustainability of irrigation, in order to realise the benefits of improved productivity, employment and rural development, whilst minimising the significant environmental risks.

The project identified strong support for cooperative partnerships across the research, education, policy and private sectors. Stakeholders articulated the need for R&D focused on achieving ambitious societal goals – sustainability, productivity, and regional development – through dynamic partnerships and the establishment of innovation networks that span the public and private sectors. Through engagement in a foresighting workshop stakeholders articulated the following broad goals for future R&D: