

The Murray Darling Basin Plan amid Drought and Civil Discontent

Glyn Wittwer
Centre of Policy Studies, Victoria University



Water Act 2007

Two main parts to Act:

1. Buybacks of water rights from farmers (water titles separate from land) for environmental purposes
2. Irrigation infrastructure upgrades

2012 Murray Darling Basin Plan

What do economists prefer?

1. Buybacks: purchase water at market prices. The act of the government entering the market pushes up the price of water. Farmers in theory should be no worse off
2. Irrigation infrastructure upgrades. Publicly funded upgrades even in the best of circumstances are unlikely to yield a satisfactory rate of return.

What has happened?

1. Buybacks: suspended after almost 1900 GL purchased out of a target of ranging from 2800 GL to 3500+ GL

2. Irrigation infrastructure upgrades to compensate for reduced water allocations.

Billions have been spent.

Superficially popular with politicians and irrigation boards.

Returns are questionable.

Two Aus economists: Quentin Grafton and Sarah Wheeler have published much on this.

S.A. Wheeler, E. Carmody, R.Q. Grafton, R.T. Kingsford, A. Zuo (2020)

“The rebound effect on water extraction from subsidising irrigation infrastructure in Australia”, Resources, Conservation & Recycling 159: 104755

Australia's water management

Warning

Water analysts around the world think Australia is a good example of how to allocate water.

Good things

Separation of land and water titles in the Murray-Darling Basin

Attempt in the 2007 Water Act to increase environmental flows

Unhelpful things

Governance of infrastructure upgrades entangled with deficient water allocation policy in the northern basin: one could argue that this makes it impossible for authorities to operate properly

Too many ~~cooks~~ government authorities

Urban water pricing is a debacle: overinvestment in desalination and water pricing that presupposes that urban catchments are in permanent drought

Case of policy being a scapegoat for hard times

Sources of hard times:

1. Drought
2. Australian exchange rate
3. MH17 impact on dairy sector

Uninformed response

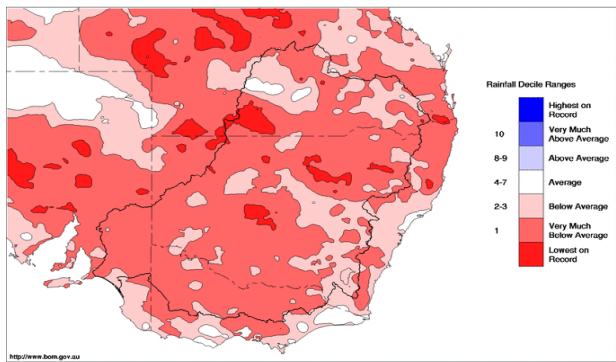
Attribute hard times to water buybacks

DROUGHT

Let's look at rainfall deciles for the Murray-Darling Basin for 9 of the most recent 18 years

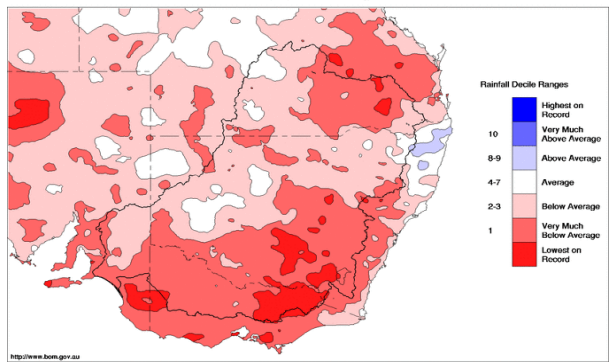
Murray-Darling Rainfall Deciles 1 January to 31 December 2002

Distribution Based on Gridded Data
Australian Bureau of Meteorology



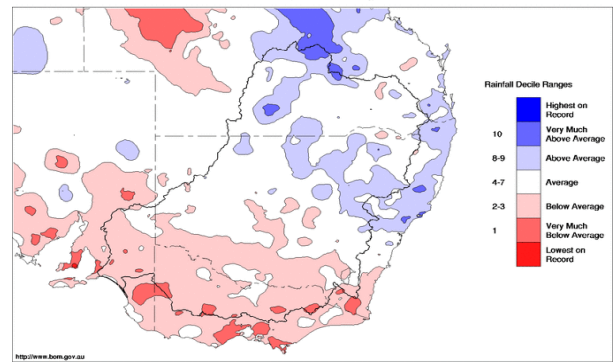
Murray-Darling Rainfall Deciles 1 January to 31 December 2006

Distribution Based on Gridded Data
Australian Bureau of Meteorology



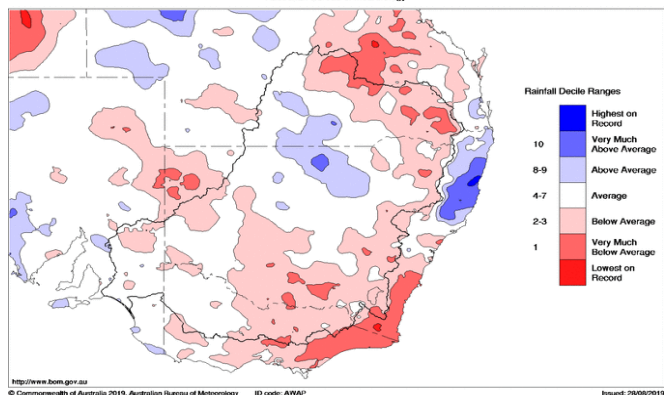
Murray-Darling Rainfall Deciles 1 January to 31 December 2008

Distribution Based on Gridded Data
Australian Bureau of Meteorology



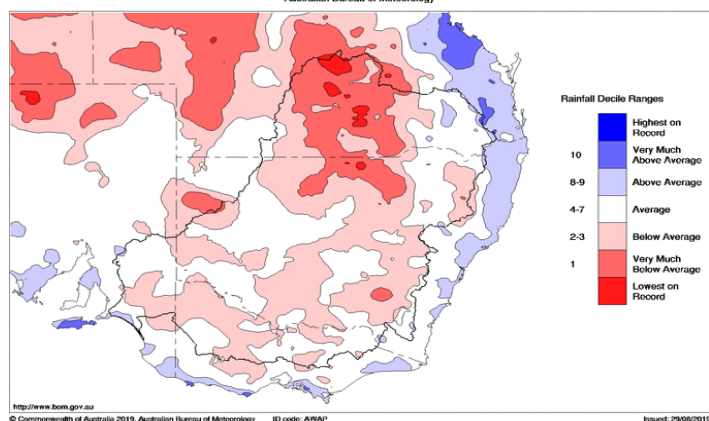
Murray-Darling Rainfall Deciles 1 January to 31 December 2009

Distribution Based on Gridded Data
Australian Bureau of Meteorology



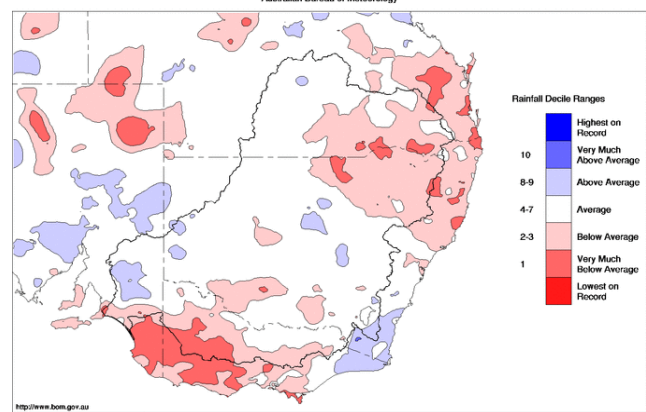
Murray-Darling Rainfall Deciles 1 January to 31 December 2013

Distribution Based on Gridded Data
Australian Bureau of Meteorology



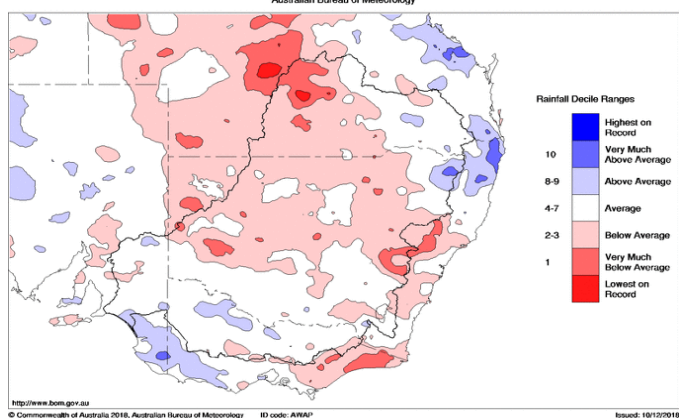
Murray-Darling Rainfall Deciles 1 January to 31 December 2014

Distribution Based on Gridded Data
Australian Bureau of Meteorology



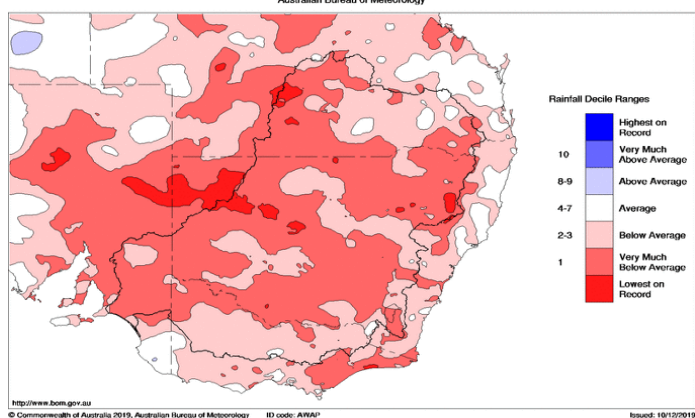
Murray-Darling Rainfall Deciles 1 January to 31 December 2017

Distribution Based on Gridded Data
Australian Bureau of Meteorology



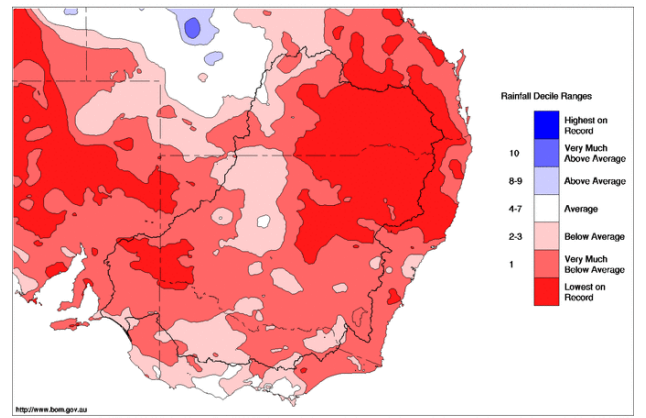
Murray-Darling Rainfall Deciles 1 January to 31 December 2018

Distribution Based on Gridded Data
Australian Bureau of Meteorology



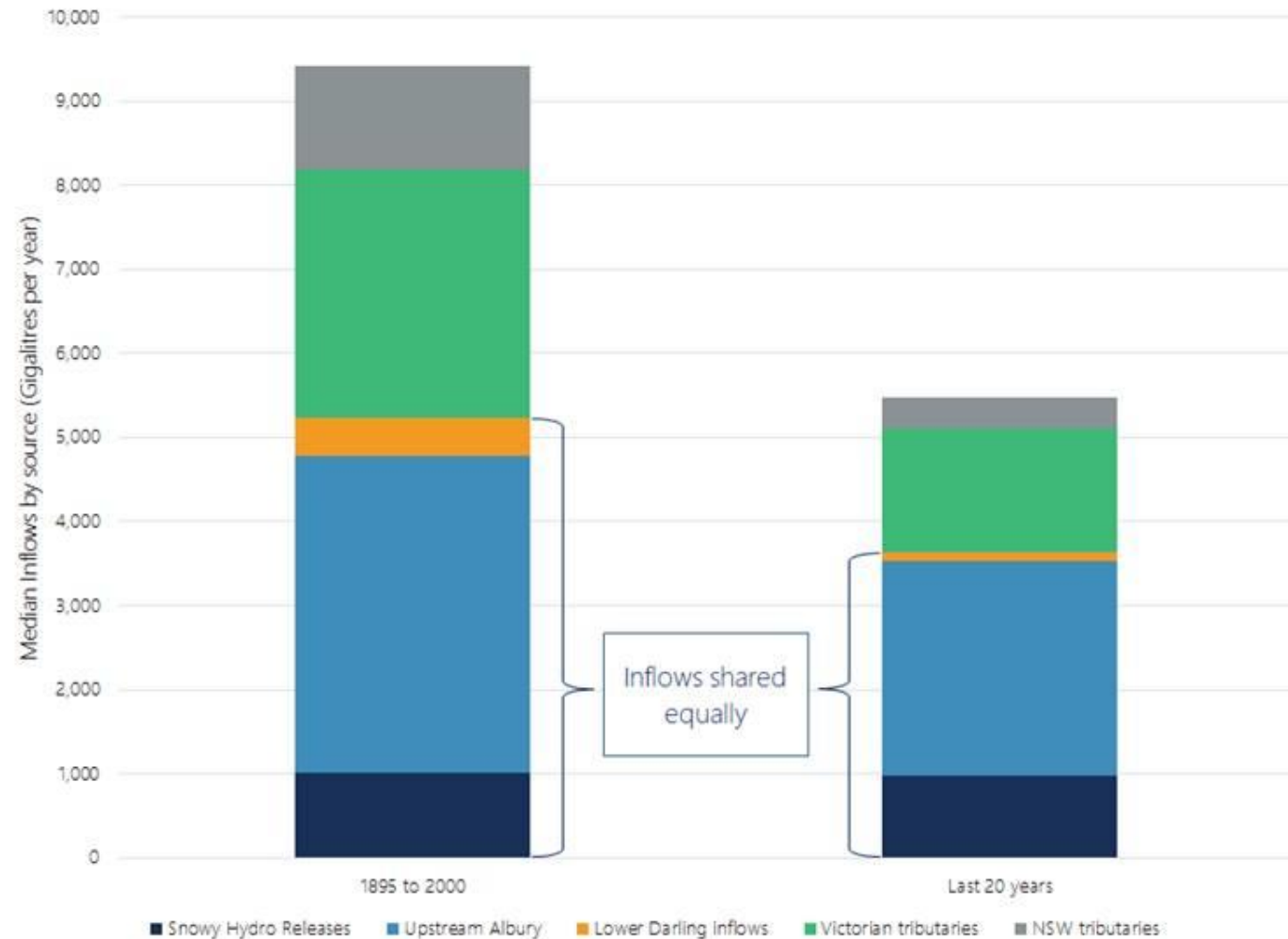
Murray-Darling Rainfall Deciles 1 January to 31 December 2019

Distribution Based on Gridded Data
Australian Bureau of Meteorology



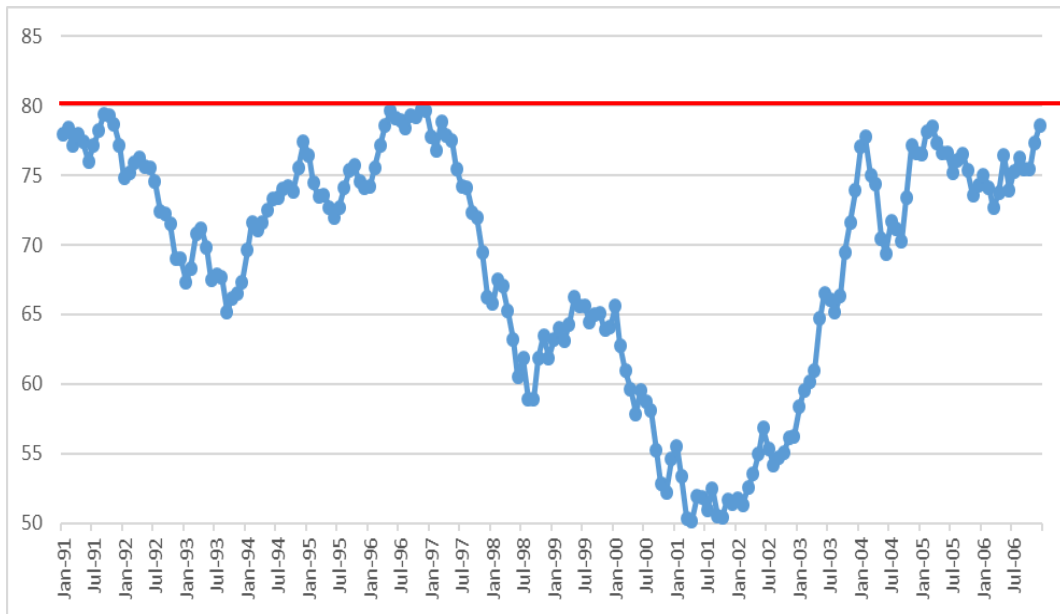
Keelty report: <https://www.igmdb.gov.au/reviews>

“The most telling finding is the dramatic reduction in inflows that has been experienced in the River Murray system over the last two decades or so. This remains the primary driver of reduced water availability, and there is little anyone can do to influence when and how much it rains.”



Australian exchange rate

US/AUD exchange rate 1991 to 2006



US/AUD exchange rate 2007 to 2015



MH17

Main impact in Australian appears to have been on the dairy market.
Russian-EU mutual bans depressed dairy prices.

Before the MH17 disaster, the dairy sector used about 1/6 of
irrigation water in the basin

Scenario: spending \$1.6 bn on more upgrades between 2020 and 2024

- In the northern basin, water use is not “capped”. Past publicly-funded infrastructure upgrades have been undertaken which appear to accelerate removal of water for irrigation (on-farm dams)
- The southern basin has more mature water allocation mechanisms. And water can be traded between regions
- A twist: we can include seasonal variation in both dry-land productivity and irrigation water allocations in the baseline

The model: TERM-H2O

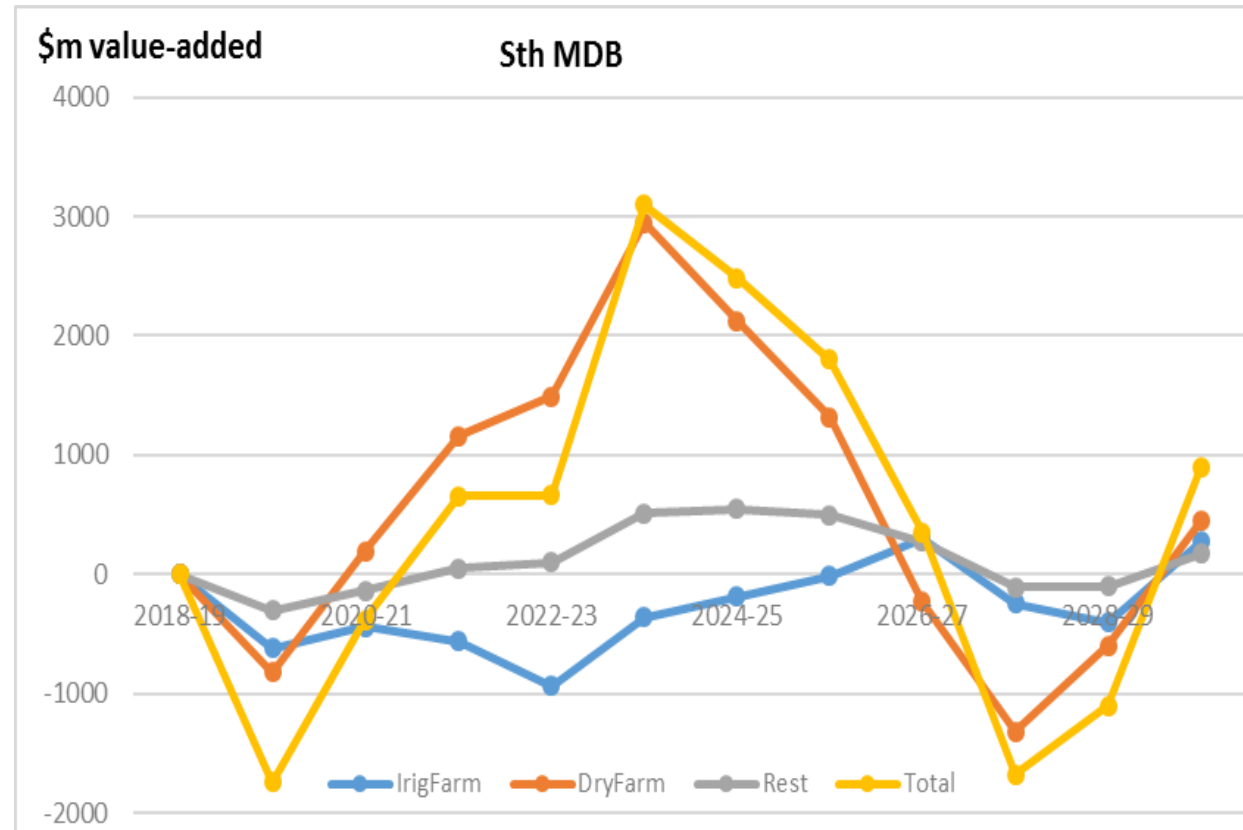
- Dynamic model of 18 basin regions and 5 rest of Aus regions, GTAP-like but within Australia



Key additions to theory of dynamic TERM-H2O

- Some capital, land and other primary factors are mobile between farm activities in the basin
- They follow a CET form on the *input* side
- Water is an input: it is tradable between regions in Southern MDB
- This representation allows big changes in activity driven by changes in water availability: TERM-H2O modelled a fall in rice output in drought of 91% relative to base (Wittwer and Griffith 2011)
- Plantations and livestock herds have specific capital
- Overall, some factors are mobile between dry-land and irrigated sectors

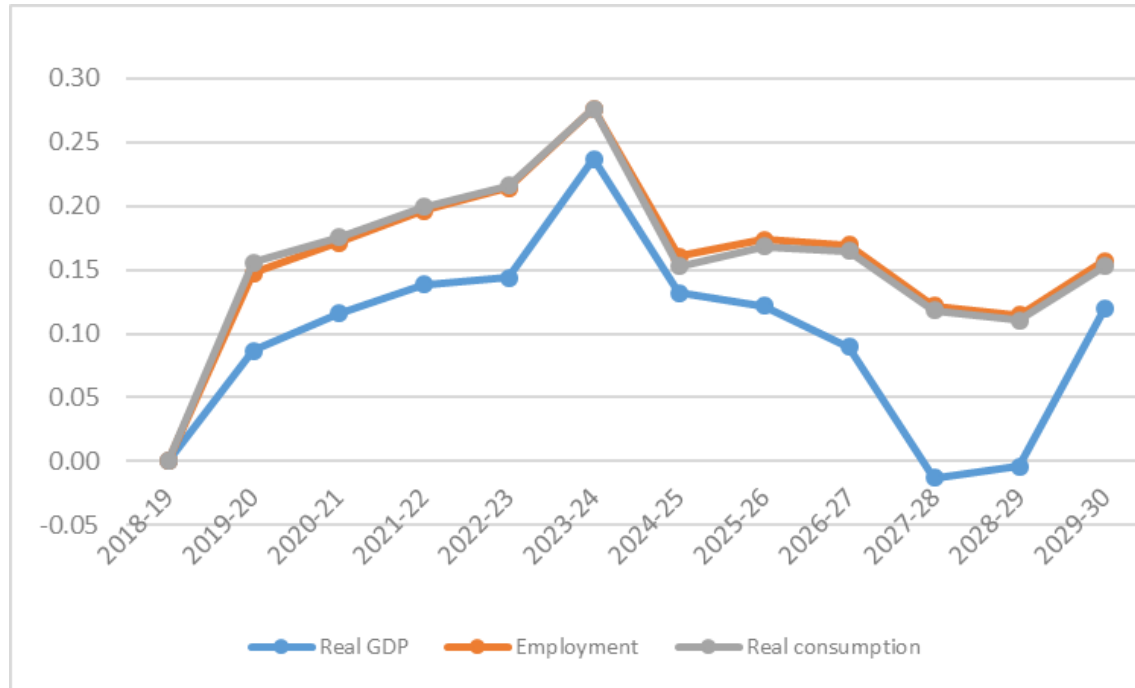
The baseline with seasonal variation



Elements of scenario

- \$1.6 bn upgrades mainly in southern basin from 2020 to 2024
- Removal of 497 GL of water from irrigation use between 2021 and 2030
- Productivity gains in irrigated sectors arising from upgrades
- **Excludes:** marginal benefits of improved town water security from upgrades. These may be “better” expenditures. A number of communities in NSW and southern Qld last year relied on carted water towards the end of the three year drought

The programs looks to be good for the economy of Southern Murray-Darling Basin



- During investment phase employment rises up to 0.25% or 600 jobs above base

Not so good nationally

$$dWELF = \sum_d \sum_t \frac{dCON(d,t) + dGOV(d,t)}{(1+r)^t} - \frac{dNFL(z)}{(1+r)^z}$$

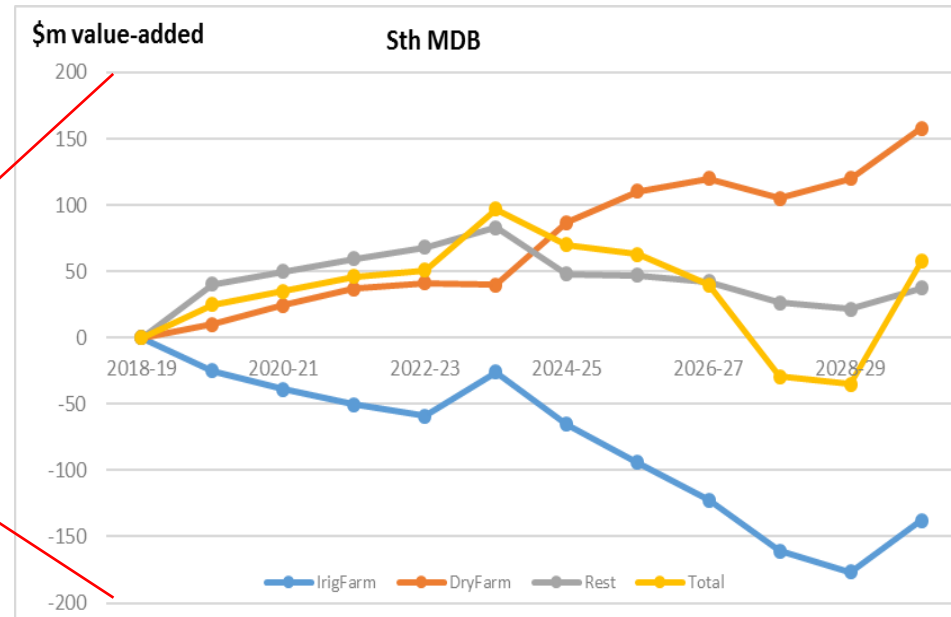
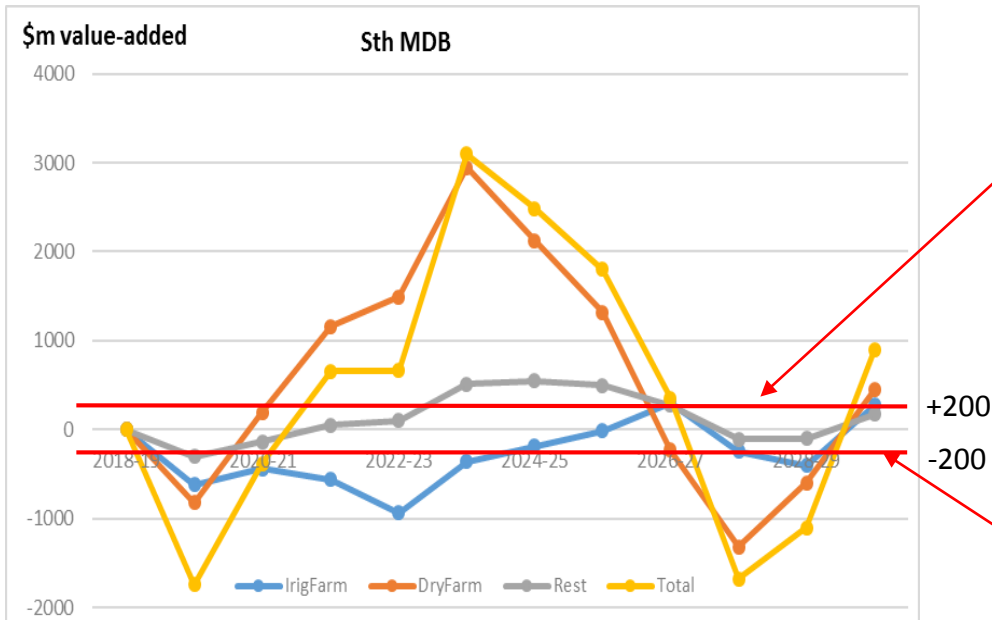
where $dCON$ and $dGOV$ are the deviations in real household and government spending in region d and year t ;

$dNFL$ is the deviation in real net foreign liabilities in the final year (z) of the simulation; and

r is the discount rate.

- National welfare falls by \$940m
 - in a \$1600m program

Key sectoral impacts



- Lost irrigation output is partly compensated by increased dry-land output through farm factor movements
- Irrigation productivity gains have a smaller marginal benefit in years of relatively low water allocations

What about public spending on human services in the basin instead?

- Each dollar spend on human services in the basin instead of infrastructure upgrades creates four times as many jobs
- The (negative) welfare impact is little more than the value of water removed from irrigation

Conclusions

- Economists have been critical of infrastructure upgrades for a long time
- There has been resistance at times within various federal and state government departments to the idea that water buybacks have small and potentially positive impacts on regions within the Murray-Darling Basin
- Bad policy has emerged from false attribution for hard times
- Signs of change include the Keelty report
- COVID-19 might also imply that fiscal measures must help broader communities rather than a narrow group of irrigators
but will this result in any changes in the expensive water plan?