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### SLIDES: Drought in the Murray Darling Basin: A 100 Year Perspective

Daniel Connell

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THE AUSTRALIAN NATIONAL UNIVERSITY

Daniel Connell

# Drought in the Murray Darling Basin a 100 year perspective

# Murray-Darling Basin

A leading example of water reform in a federal political system



Pre-federation – from 1850s

- Navigation v irrigation

Post Federation – 1960s

- Community development based on irrigation

1980s – 2000s

- Economic growth v/ & environmental remediation
- Place of indigenous people in the MDB
- Markets

Now

- Sustainability/environmental-resource stability (What? How?)

# Variability in the MDB - long recognized

## 1902 Interstate Commission re the future of the Murray

- Wimmera River – twelve fold variation between wettest and driest year
- Goulburn four
- Murrumbidgee seven
- Darling ten

Records now show the variations are much greater

# Impact of Federation

Early debates dominated by navigation v irrigation

- NSW wanted VIC cooperation re a dam across the Murray and inflows from VIC rivers
- VIC wanted a dam across the Murray and access to its water (NSW-VIC border is the southern bank)
- SA wanted a dam across the Murray, locks and restraints on VIC and NSW to protect navigation (after Federation it used its presence in Commonwealth Govts to exert pressure on both)

Each hesitated to act alone because their constitutional rights were not clear (S100)

## Interstate water sharing formula

(RMWA 1914/15, MDBA 1992 Water Act 2007/8)

- NSW and VIC share equally inflows into Hume Dam (and keep inflows into their tributaries)
- NSW and VIC supply South Australia a set volume in average-wet years (now 1850GLs)
- Dry years – special accounting
  - three states divide Hume Dam equally.

# Forces for change 1990s early 2000s

- MDB over allocated – only greater efficiency will allow continued economic growth
- Management systems unable to halt environmental decline and erosion of resource security
- Pressure to maximize autonomy of producers and minimize bureaucratic discretionary decision making
- Increasing recognition of many additional stakeholders
- Demands that more costs of the supply system should be passed on to producers
- Stalled implementation of MDB Cap = failure of reform program



# Severity of the 2000s drought

- More severe than previous extreme drought 1895 – 1902
- In southern MDB most rain falls in winter/spring. In 2006 winter/spring rain was 10% of average and 2007 was similar
- Australian system plans for extremes – provides proportions of available flow and holds back a reserve to cover following year.
- For planning the extreme low was a composite of the previous 12 worst months (2006/7 much lower than the worst composite year)
- In 2006/7 many months were new record lows so the planning minimum is now adjusted for greater extremes (new allocation category 'critical human needs')
- Political adjustment protected towns
- Water trading minimized economic loss to agriculture - severe environmental loss.
- Basin Plan 2012 - new arrangements to manage 2006/7 lows

# Water Act 2007/8

- Nat Govt displaced the states and took control of high level planning
- Comprehensive Basin Plan approved 2012 - includes groundwater and environmental water and can adjust to climate change (with difficulty)
- States to implement Basin Plan through sub plans (backed by funding)
- Basin-wide environmental sub-plan
- Basin wide caps (surface and groundwater)
- increased water trading across borders
- More transparent and better info base (auditing by national agencies)

# Will the Basin Plan Survive? If not what then?

- Many compromises but core elements are widely accepted
- Shaky foundations, purchaser-provider, state resistance growing
- Comprehensive state sub-plans will come under intense pressure
- Entitlements for the environment are in place - rough and ready and expensive formula but could stand alone
  
- Alt is to go for key elements
  - Detailed auditing and monitoring and empowered wider range of stakeholders
  - Devolve substantial water management power to regions bringing in stakeholders beyond the irrigation sector with the national government maintaining an auditing role backed by the capacity to fund  
(would give communities reasons to get involved and develop knowledge)



# Future

(CSIRO 2006 study re future threats to inflows commissioned by MDBMC)

Emerging issues – climate change, farm dams, forest plantations, bio-replantings, reduced leakage etc (all outside the policy agenda resulting from the operation of the unanimity principle in MDBMC)

Context 25,000 GL p.a. inflows, 11-12000 GL p.a. use

3000 GL out Murray Mouth (none in many recent years)

Predicted reduction

2500 -5000 GL p.a. next 20 years

4500 – 9000 GL p.a. next 40 years

# Role of Hume Dam

- Since Hume Dam completed in 1936 water always drinkable
- 90% of South Australian towns receive water from the MDB
- Adelaide averages 40% dependence but has gone to 90%
- Without Hume and other storages the population of South Australia and the MDB would be much smaller

# Hume Dam

(The key River Murray storage)



# Major cultural shift

- The previous century old system was based on a close identification of interests between State govts and irrigation communities supported by the wider public. Major decisions were made by public service water administrators.
- *National Water Initiative 2004* - a rights and responsibilities system in which govts become arbitrators between a wide range of competing interests - to be introduced after environmental sustainability has been achieved.



(refined by National Water Initiative 2004)

- Define sustainability and if necessary reduce extractions and change management practices to achieve it
- Use water trading between states and different uses (urban, agriculture, environment, mining etc) to maximize benefits from what is available after sustainability is achieved
- Strengthen legal definition of water entitlements and handover regional distribution systems (gratis) to irrigator organizations that will then take full responsibility for future infrastructure development and maintenance (and drought and climate change management)

### Challenge

How to transition from historical levels of development which occurred without awareness of sustainability issues?

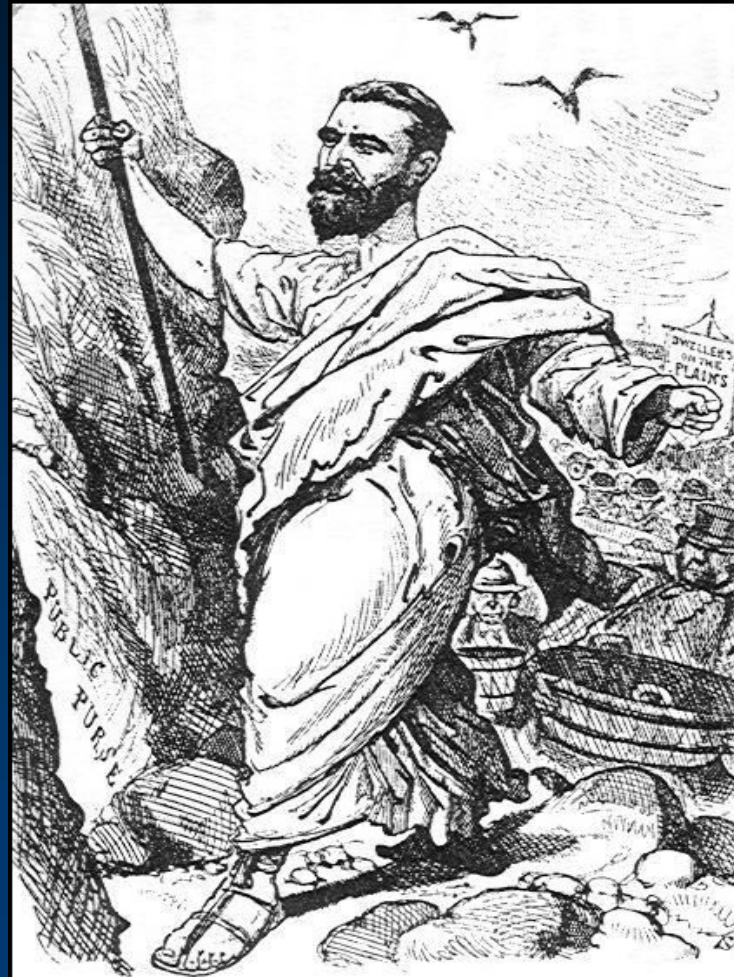
# Australia

Governments were the leading developers so they passed laws allowing them to impose public priorities

## Alfred Deakin MP

newspaper cartoon comparing him to Moses delivering water to his people in the desert

(striking the rock of the public purse - irony?)



- Whole of catchment whole of hydrological cycle planning-management framework
- Management framework integrated at different levels of the federal system  
MDBA plus states
- Proportions of available flow approach which can manage high variability without institutional and political crisis
- Public policy orientated water sharing system that reflects political realities
- Wide political and cultural support for the water management system and its underlying priorities
- Cultural acceptance of comprehensive monitoring and that information should be publicly available
- Governance system that can respond quickly to crisis
- Technical and management capacity (Governance) to implement all of the above

# Drought

## a test of institutional resilience

- Analysis of drought management can be the starting point for a comprehensive institutional analysis
- Stress from drought highlights:-
  - strengths and weaknesses that are usually hidden
  - political priorities and underlying cultural values revealed by difficult choices
- Societies will manage climate change in the same way they manage droughts (for better and worse)

# NWI – many aims

- Reduce political disputes by protecting key environmental values and providing resource security
- Increase economic growth via water trading
- Recognize Indigenous interests
- Increase capacity to resolve cross-border disputes
- Protect established irrigation communities
- Meet international environmental obligations
- Manage climate change, bush fires, forest plantations, farm dams, consequences of improved irrigation efficiency etc
- Promote best practice water management
- A cultural shift from agricultural mining to sustainable production

# 19<sup>th</sup>-20<sup>th</sup> Centuries water management

(Common themes in the four MDB states)

- Aim was creation of communities and expansion (not restraint)
- Ministerial discretion/control by State agencies
- Creative responses to variability (in conflict with demands for certainty)
- Groundwater and surface water managed separately
- Compliance not an issue (apart from droughts)
- Many differences between regions even though they were administered by centralized agencies
- Poor documentation of the great variety of management systems-entitlements (tradable products not an aim)

## Within states

- States allocate so they can supply through two dry years in a row
- Entitlements are a percentage of available water under defined conditions of supply
- Many different types of entitlements with varying levels of security (to take account of the security needed for particular activities ie towns, orchards, rice etc)
- Govts announce low allocations early and then increase them as it becomes clear whether it will be a wet or dry year
- NSW allocates a higher proportion of its quota because it has a different mix of activities compared with Vic (NSW more annual crops, Vic more long term ie horticulture etc).