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Water Solutions for a Variable Climate: An Australian Perspective


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AUSTRALIA – KEY FACTS



- Federation of 6 States and 2 Continental Territories
- European Settlement 1778
- 7.7 million km²
- 23.5 million inhabitants
- 90% of population resides within 100km of the coast
- Occupied private dwellings 7.64 m
- Average household = 2.7 people.



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A CONTINENT OF EXTREMES



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3

THE NEW FACE OF WATER SCARCITY



- Declining Yields as a consequence of drying (and warming) climate
- Population Growth
- Need for increased environmental flows for stressed rivers

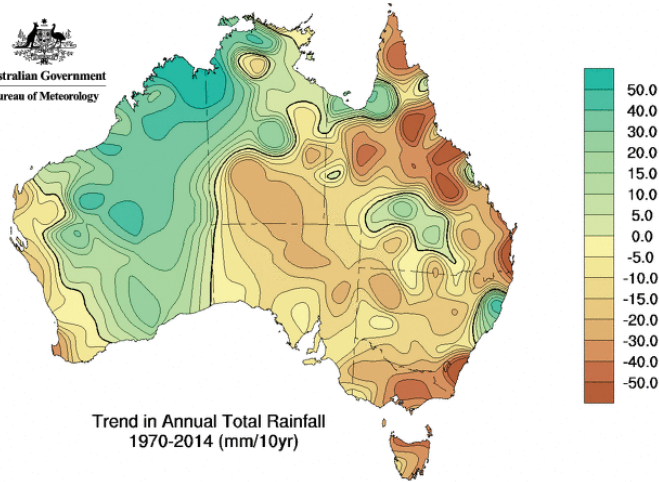
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4

DECLINING RAINFALL IN KEY AREAS



Australian Government
Bureau of Meteorology



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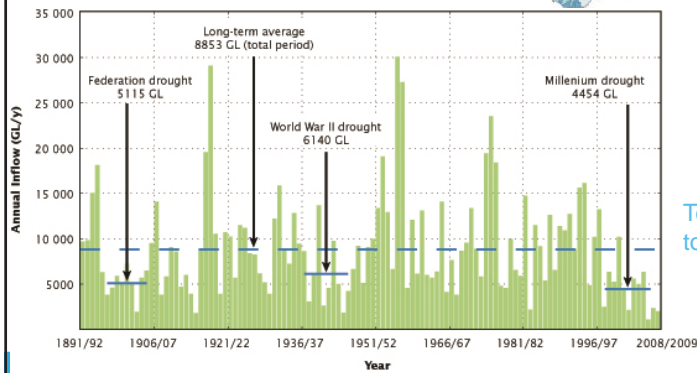
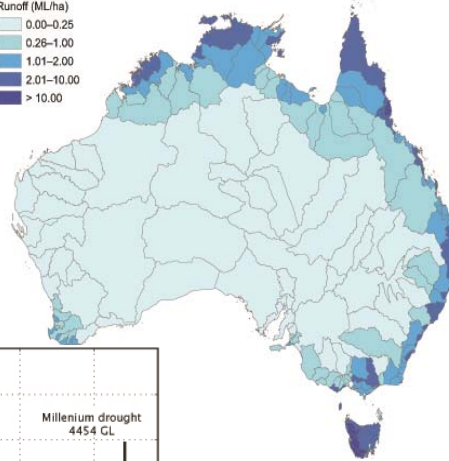
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RAINFALL IS BOTH VARIABLE AND VOLATILE

Runoff (ML/ha)

- 0.00-0.25
- 0.26-1.00
- 1.01-2.00
- 2.01-10.00
- > 10.00

Average annual surface runoff
by catchment (ML/ha)



Total annual inflows
to the Murray River

6

The National Response

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NATIONAL PLAN FOR WATER SECURITY

National Water Initiative, 2004

Objective: Economically efficient water use and improved environmental outcomes. Federal and state governments committed to:

- prepare water plans with provision for the environment
- deal with over-allocated or stressed water systems
- introduce registers of water rights and standards for water accounting
- expand the trade in water
- improve pricing for water storage and delivery
- meet and manage urban water demands (although the focus was on rural sector, especially the Murray Darling Basin.)



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8

URBAN WATER SECTOR: A PORTFOLIO RESPONSE



Water Corporation
(W.A.) – Security
Through Diversity

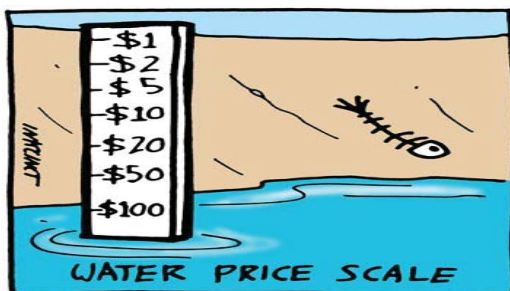
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9

VALUING AND PRICING WATER



- Urban (and increasingly irrigation) supplies are accurately metered
- Charging increasingly based on consumption – not fixed or “tax” based
- Water Prices are based on full cost recovery (with some exceptions)
- Utilities have undergone extensive reform to deliver competitive neutrality, reduce hidden subsidies and improve commerciality



Further reform contemplated:

- Deliver effective market for urban water
- Costs to reflect water scarcity in times of shortages
- Policies that restrict interaction between water used by rural and urban sectors limit opportunities for inter-sectoral trade

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10

WATER EFFICIENCY IS A MAJOR TOOL: HOUSEHOLDS AND INDUSTRY

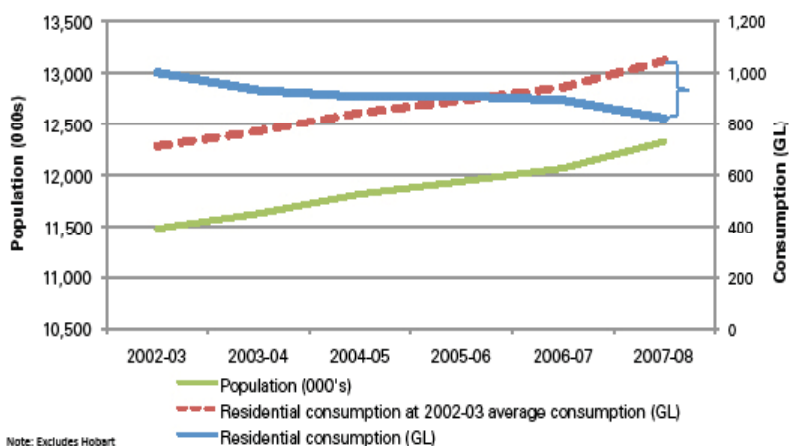


- Water Efficiency Labelling and Standards (WELS) Scheme – minimum efficiency standards and consumer advice: showers; taps; flow controllers; toilet (lavatory) equipment; urinal equipment; clothes washing machines; and dishwashers
- Community Education and Programs to encourage the installation of Waterwise gardens and efficient irrigation systems; Smart Approved Watermark certifies water saving products
- Rebates for water efficient appliances and retrofitting dual flush toilets
- Water audits of the commercial and industrial sector in improving water efficiency
- Water Saving Rules: limits on hosing of paths and hard surfaces; garden watering only between 18.00 and 10.00; approved Water Use Plan for public gardens/parks; trigger nozzles on hoses.

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11

CAPITAL CITY WATER CONSUMPTION AND POPULATION (2003 – 2008)



Source: WSAA Report Card for 2008/09

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12

RURAL WATER RESPONSE: POLICY, IRRIGATION UPGRADES AND ON- FARM EFFICIENCY



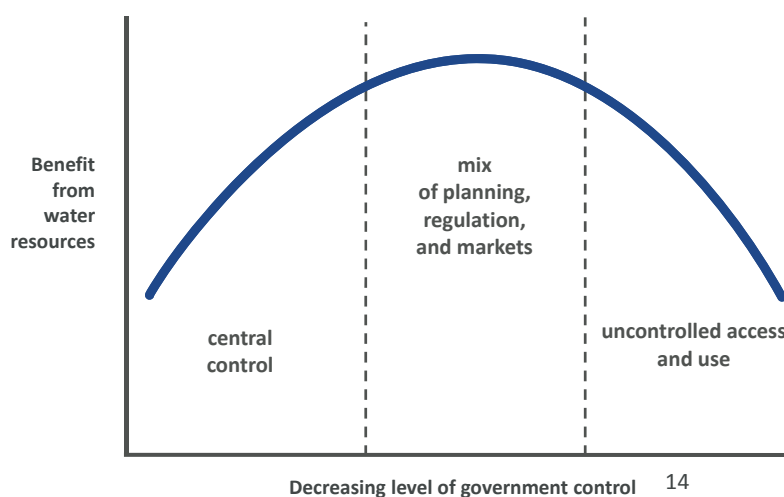
- Tradeable Water entitlements
- A market price for directs water to the "highest and best" use
- Irrigation System upgrades to cut system losses: piping or lining of irrigation channels; withdrawal of irrigation from marginal areas; flow monitoring and control for system optimisation
- Government support for on farm efficiency upgrades: drip irrigation; laser levelling of flood irrigated pastures;
- Metering of all water abstracted (groundwater and surface water) – track usage, leaks and water theft
- Flexible crop plantings: plant cotton only when water available and cheap.
- Extensive use of technology: moisture sensors to optimise water application; extensive use of weather forecasting; computer modelling to determine required water for specific crops



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13

MARKET, REGULATORY AND PLANNING BASED APPROACH TO WATER POLICY AND MANAGEMENT



14

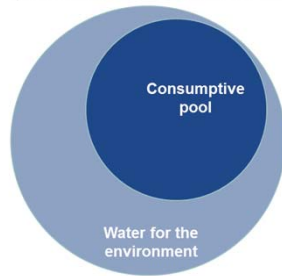
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14

ESTABLISHING WATER MARKETS VIA 'CAP AND TRADE' APPROACH



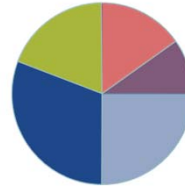
1) Limit total extractions from water resource



2) Limit/specify extractions for each user



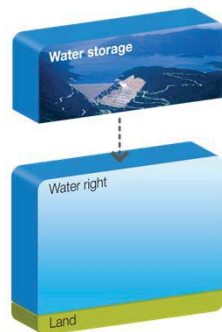
3) Trade allows individual water use to be reallocated



UNBUNDLING OF WATER RIGHTS



PRE-WATER REFORM



NWI REFORMS



Unbundling →

FINAL OBSERVATIONS



- Irrigation efficiency can be looked at a number of ways – but mainly **technical** and **allocative**
- While technical efficiency (trickle tap irrigation etc.) now delivers diminishing returns, it seems to remain the focus
- Allocative efficiency is less well understood, but offers greater potential gains: **step change** through structural change
- In this context, allocative efficiency = efficiency in the allocation of available water resources to different productive (and environmental) uses
- When it comes to the allocation of scarce resources, **markets are key**
- Australia has incorporated a markets based approach into its water policy and management framework
- By establishing a mechanism to reallocate water between different uses, we are getting significantly **greater value from limited water resources**: more crop per drop
- In the millennium drought, water availability dropped by 70%, but the gross value of irrigated agricultural product only reduced by half that amount: water was traded to the **highest and best use**.



THANK YOU

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