# Gestión integrada de cuencas: la experiencia de Australia y su aplicación en el contexto nacional

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CSIRO

## Contenidos

- ¿Qué es CSIRO?
- La experiencia de Australia en la gestión integradad de cuencas: el caso Murray-Darling
- Proyecto para la Cuenca de Copiapó

# ¿Qué es CSIRO?

## What we do

**Our Vision**
Our science is used to make a profound and positive impact for the future of Australia and humanity.

**Our Mission**
We deliver innovative solutions for industry, society and the environment through great science.

# CSIRO

| | |
|---|---|
| People | 6500 |
| Flagships | 9 |
| Locations | 58 |
| Budget | $1B+ |

**Top 1%** of global research institutions in 14 of 22 research fields
**Top 0.1%** in 4 research fields

**62%** of our people hold university degrees
**2000** doctorates
**500** masters

With our university partners, we develop **650** postgraduate research students

# Our Science Programs (Flagships)

AGRICULTURE

BIOSECURITY

DIGITAL PRODUCTIVITY

ENERGY

FOOD & NUTRITION

LAND & WATER

MANUFACTURING

MINERAL RESOURCES

OCEANS & ATMOSPHERE

## **Our track record:** top inventions

**1. Fast WLAN**
Wireless Local Area Network

**2. POLYMER BANKNOTES**

**3. RELENZA FLU VACCINE**

**4. EXTENDED WEAR CONTACTS**

**5. AEROGARD**

**6. TOTAL WELLBEING DIET**

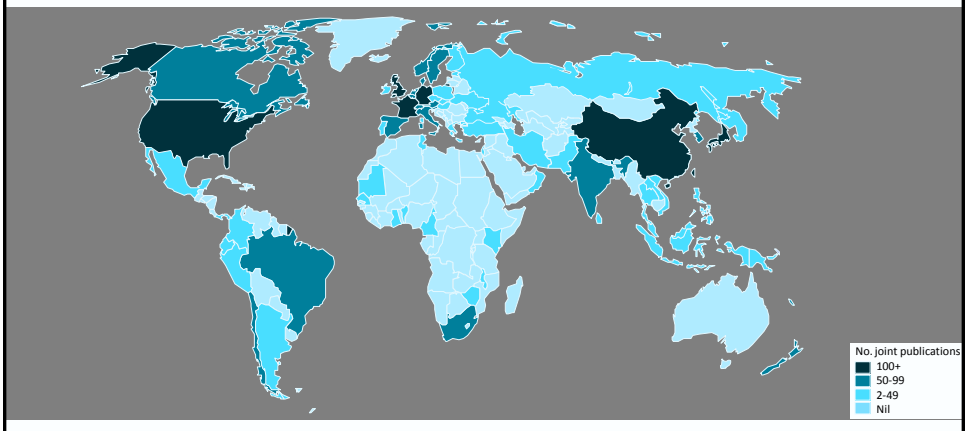
**7. RAFT POLYMERISATION**

**8. BARLEYMAX**

**9. SELF TWISTING YARN**

**10. SOFTLY WASHING LIQUID**

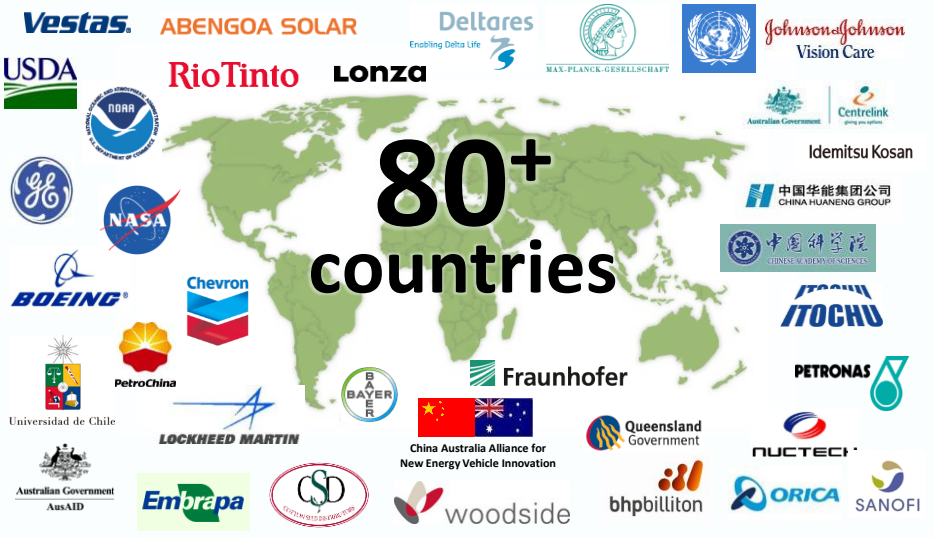
## Global connections




**We work with partners in over 80 countries**

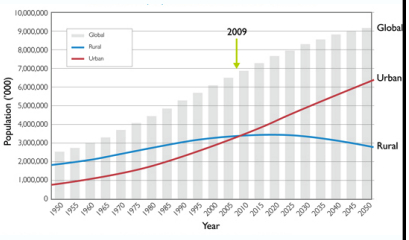
- Foreign governments
- Small to large companies
- Multi-nationals
- International foundations
- Leading scientific institutions
- Over 700 research activities

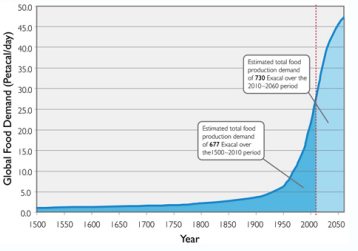
## **Global Contacts :** impact of partnerships




## Water management – a global challenge

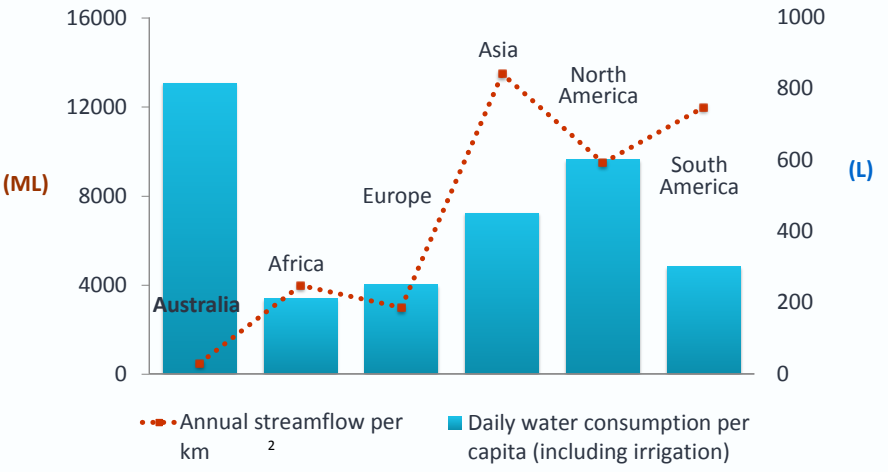
- Climate change complexities
  - Acceleration of the global water cycle
  - Redistribution of a limited resource
- Population growth
  - Additional 2.5 billion globally by 2050
- Urbanisation & industrialisation
  - Increasing demand for water, energy, resources, land and food
  - Increasing waste streams – sewage & industrial
- Global food security
  - Increasing demand for high protein diet
  - Increasing energy intensity for food production
- Environmental consequences
  - Changes in river and groundwater hydrology
  - Changes in water quality
  - Changes to biodiversity and ecosystem services



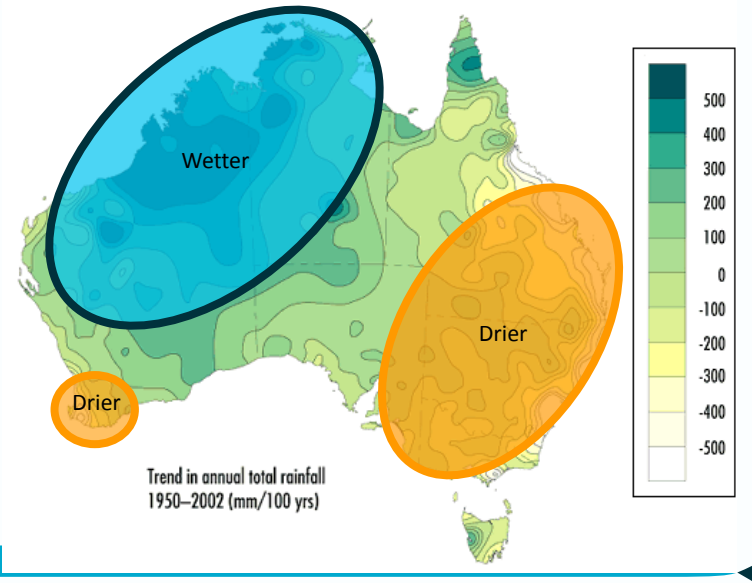



# La experiencia de Australia en la gestión integradad de cuencas: el caso Murray-Darling

## Australia – the driest inhabited continent – with the highest per capita water use



## Rainfall distribution has changed since 1950




## Crisis in Australia forced the integrated water management process

- Science – evidence and decision support
- Trust – put down the guns
- Sharing of power – institutional reform; laws, policies & programs
- Time – 20 years
- Mandate – is the time right
- Resources – commensurate with the problem

*Ongoing capacity building, consultation & communication*

## National Water Initiative –
### a transformational policy response

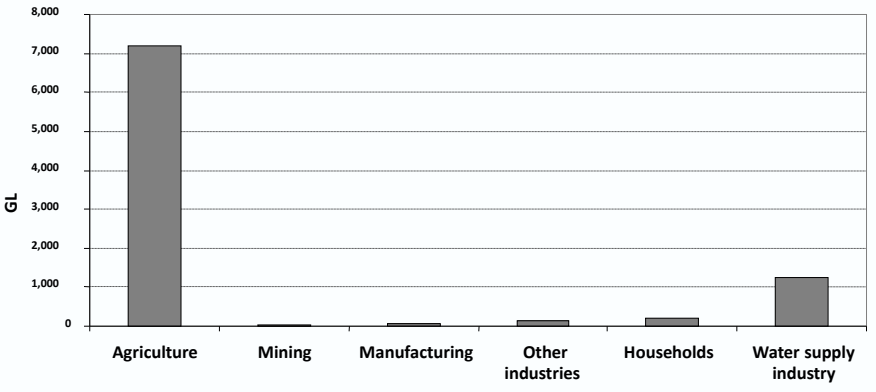
- Return all water systems to **sustainable levels of extraction**
- Provide **secure water entitlements** for **irrigators** and the **environment**
- Improve **security** and **management of urban water supplies**
- Improve water **data collection and accounting**
- Invest in **knowledge** and **build capacity**

## The Murray-Darling Basin

- 14% of Australia (size of Spain & France)
- Directly supports 3 million people
- Feeds approximately 20 million people
- Significant environmental values
- Australia's three longest rivers
- 40% Australia's farmers
- Home to 34 major Indigenous groups

- There are six governments with responsibilities in the MDB:
  - Australian government,
  - the Australian Capital Territory,
  - New South Wales,
  - Queensland,
  - Victoria, and
  - South Australia.

# Consumptive water use



## The need for water reform

- Concerns about the state of the environment
  - water overuse,
  - salinity
  - nutrient pollution
- Plus a decade-long drought in the southern part of the basin that ended in 2010
- Resulted in major water reform and changes to governance structures over the past 15 years.

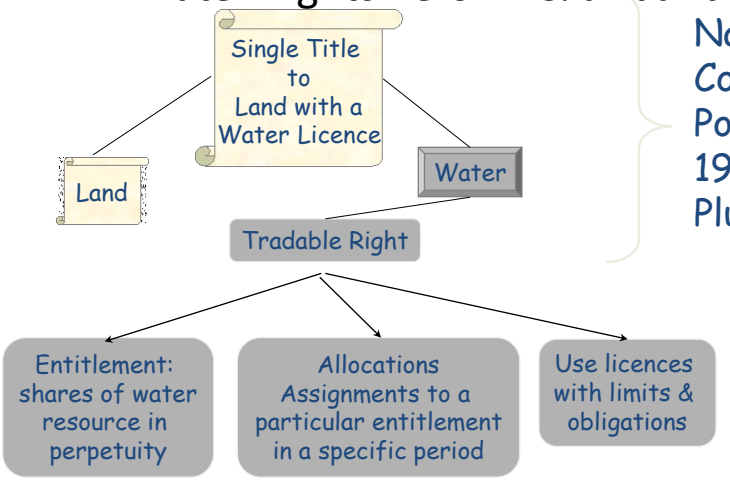
## The need for water reform

- Return extraction of water to a more sustainable level
- Support ecological health of the Basin
- Build a more certain future for communities
- Sustain economic output over long term
- Manage water resources for future generations
- What's the right balance?: Trade-offs: optimise economic, social and environmental outcomes
- Measuring the benefits and the costs
- Set environmental thresholds

# Major elements of the reform

- Promotes water trading
  - Unbundling of water rights from land ownership in 1994
  - Difference between water “entitlements” and water “allocations” (both can be traded)
- Establishment of a cap on total surface water abstraction:
  - Limits withdrawals
  - Rules out ne claims on water resources
- Governments take action to secure flows for the environment:
  - US$ 450 millions in 2004
  - US$ 2,700 millions in 2007
- Establishment of the Murray-Darling Basin Authority in 2007.

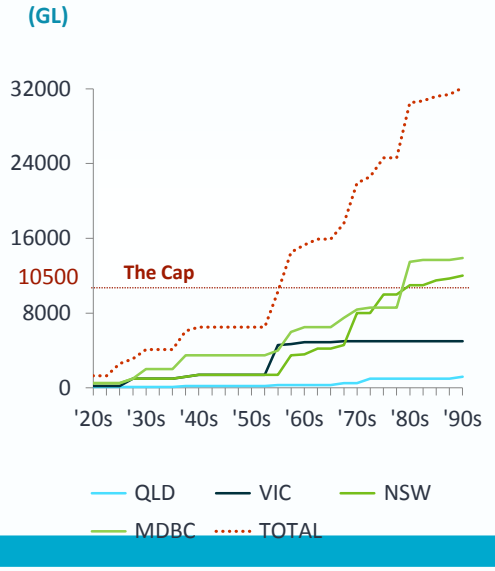
# Water Rights Reform & unbundling




National Competition Policy 1993/94 Plus Cap

National Water Initiative 2004

## The Murray-Darling Basin

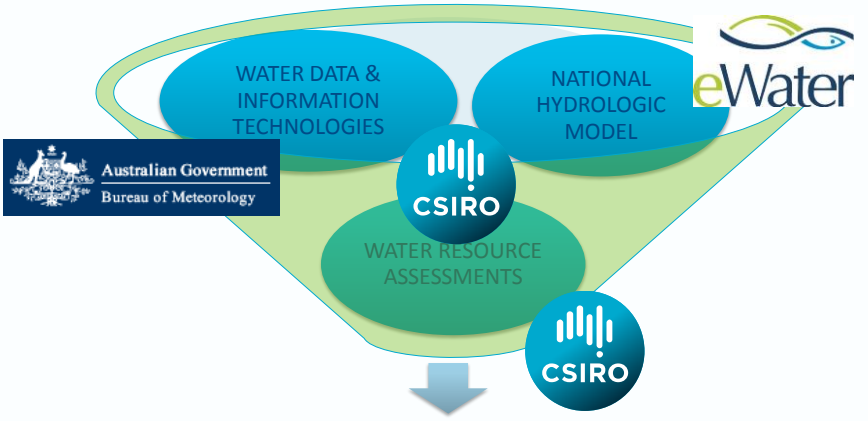



- **70%** of Australia's irrigated agriculture

**However...**

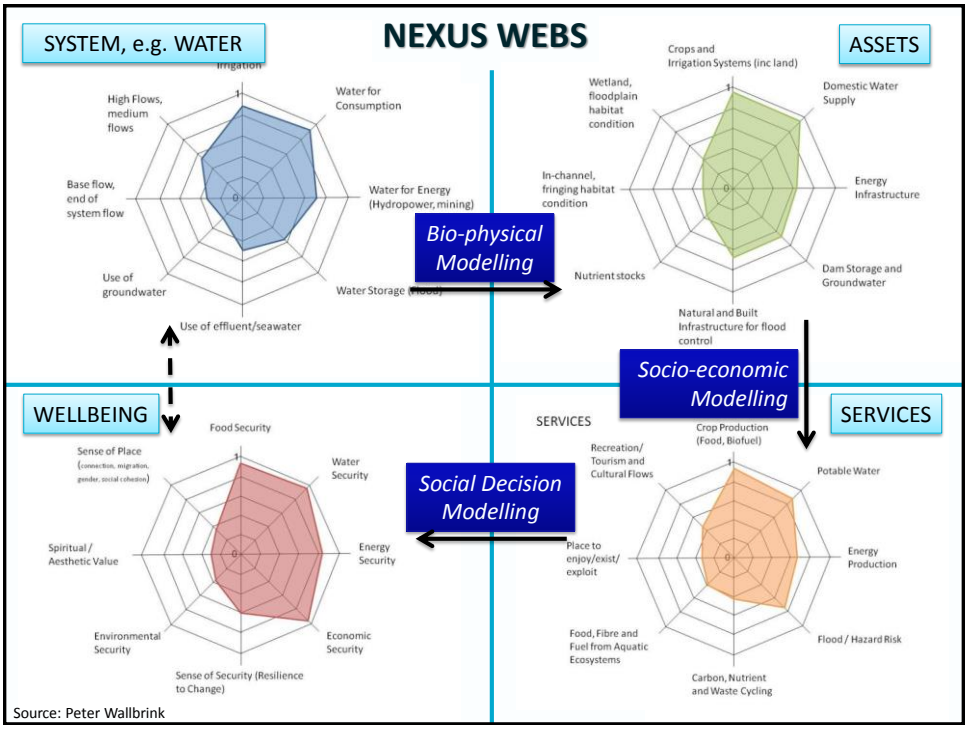
- Serious **over-allocation** of water between 1960s-1980s
- **Driving Philosophy:** You can't manage what you can't describe and measure
- Must move from **perceptions to fact**

## In 2005, >$600M government investment into Water Information, Knowledge and Tools




National technological capability to support basin-scale water resources planning and management under climate change

# Integrated modelling – systems nexus




Source: Peter Wallbrink

# Proyecto para la Cuenca de Copiapó

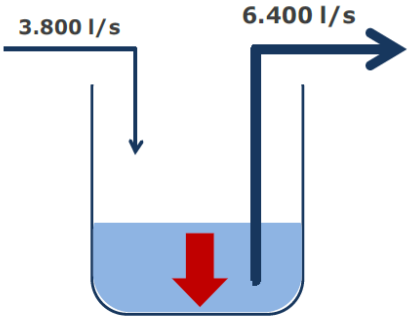
## DGA (March 2012) estimate of imbalance

**Rights issues exceed 19.000 l/s** **Storage losses are 2.600 l/s**

**Most water rights are not used because of:**

**1) lack of water, 2) high cost of extraction, 3) poor quality**

**4) need for water supply security, 5) speculation ?**




- **Agricultura:** 4.500 l/s ➔ **71%**
- **Minería:** 1.430 l/s ➔ **22%**
- **Consumo humano:** 400 l/s ➔ **6%**
- **Otros:** 70 l/s ➔ **1%**

All demands are increasing

## Plan de gestión integrada para la cuenca de Copiapó

- Una Estrategia de desarrollo para la cuenca de Copiapó, establecida de común acuerdo entre los diferentes actores participantes, qué considere los valores de la minería, la agricultura, el medio ambiente y los valores sociales.
- Un marco y una metodología general para una planificación integrada de cuencas, adecuada para aplicarse a nivel nacional, la cual debe estar alineada con la Estrategia Nacional de Recursos Hídricos.

## Plan de gestión integrada para la cuenca de Copiapó

- **Fase 1**
  - Bases del proyecto
  - 6 meses
- **Fase 2**
  - Implementación del proyecto
  - 2,5 - 3 años

# Resumen Fase 1

- **Diseño del proyecto**
  - **Estructura de gobernanza y actores clave**
- **Aumentando la participación**
  - **Consultas con actores clave**
  - **Desarrollo de "Visión Compartida"**
- **Difusión del proyecto**
  - **Identificación y reuniones con posibles fuentes de financiamiento**
  - **Delegación a Australia**
- **Desarrollo de TdRs para la Fase 2**
  - **Modular: US$ 2 millones v/s US$ 2+ millones**

# Visión Fase 2

| Phase | Stage/timeframe | Year 1 | Year 2 | Year 3 | Year 4 + |
|---|---|---|---|---|---|
| Two | **Underpinning studies** | | | | |
| | *Establish vision & baseline* | | | | |
| | *Identify sustainable yields* | | | | |
| | *Identify options (1st pass)* | | | | |
| | **Develop and analyse options** | | | | |
| | *Decision support tools* | | | | |
| | *Refine and select options* | | | | |
| | **Pilot 1** | | | | |
| | *Implementation* | | | | |
| | *Review & improve* | | | | |
| Three | **Phase 3 - Pilot 2 (scaled out)** | | | | |

## Potenciales productos de la Fase 2

- **Específicos**
  - Estado de la cuenca
  - Escenarios futuros acordados (derechos y límites)
  - Plataforma de información sobre recursos hídricos (accesibilidad)
  - Procesos y modelo para fortalecimiento de capacidades
- **Generales**
  - Plan de gestión integrada para la cuenca de Copiapó
  - Marco general de aplicación a nivel nacional

## Pilotos

- Principios
  - Win-win
  - Sin arrepentimiento
  - Arrepentimiento bajo
  - Balance público-privado
  - Triple bottom line considerations
- Ejemplos
  - Infraestructura (reutilización de aguas urbanas/mineras)
  - Water trading (cap and trade; auction; buy back)

# Gracias

www.csiro.au