



# Policies to Manage Agricultural Groundwater Use

## AUSTRALIA

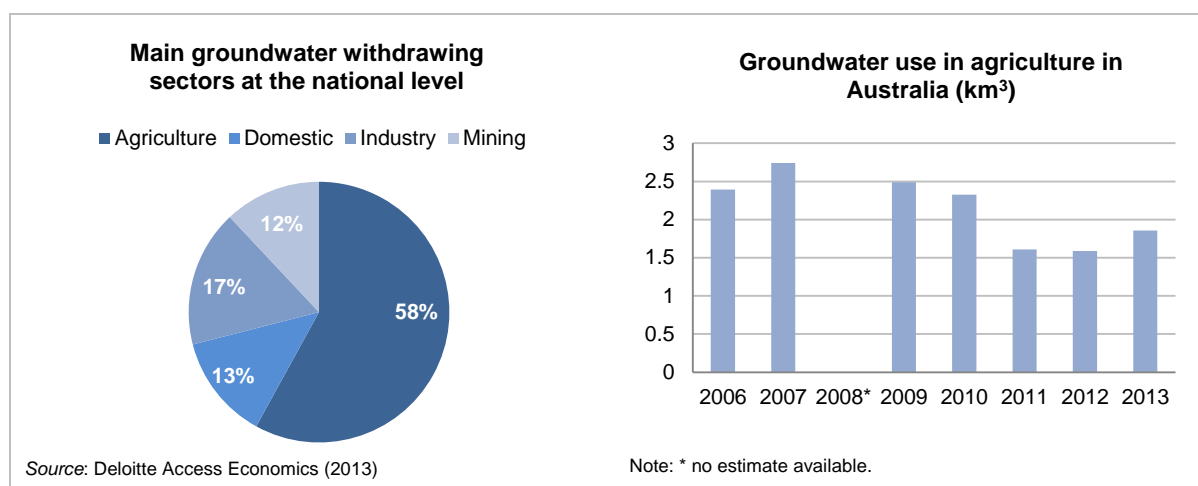
Australia is one of the top ten OECD countries in groundwater use for irrigation. Agriculture represents over 50% of total groundwater withdrawals. Groundwater is managed by state and territory governments, using regulatory and economic instruments. Two major agriculture regions, the Great Artesian Basin and Murray Darling Basin, which rely on surface water irrigation, are expected to face drier and hotter conditions under climate change and may therefore use groundwater more intensively in the future.

### 1. Main national governmental agency responsible for quantitative management of groundwater

Institution	Role
Commonwealth Department of the Environment and the Office of Water Science	The Department of the Environment assists to formulate and implements Australian Government policies and programs to protect and conserve the environment. Portfolio responsibility includes developing and implementing policy and frameworks concerning the allocation and use and trading of groundwater. It also plays a monitoring, evaluation and reporting role on groundwater use.
Murray–Darling Basin Authority	The Murray–Darling Basin Authority (MDBA) is a Commonwealth agency, within the Environment portfolio. The Water Act 2007 requires the MDBA to undertake a number of functions that support the sustainable and integrated management of the water resources of the Murray–Darling Basin in a way that best meets the social, economic and environmental needs of the Basin and its communities. Under the Murray–Darling Basin Agreement, the MDBA is responsible for managing the Basin's water resources.
Geoscience Australia	Geoscience Australia applies geoscience to Australia's most important challenges by providing geoscience information, services and capability to the Australian Government, industry and stakeholders on a range of matters including groundwater.
CSIRO	The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency and one of the largest and most diverse research agencies in the world. CSIRO expertise in groundwater hydrology provides robust science to underpin effective water resource planning for the sustainable use of Australia's groundwater.

## 2. Status and use of groundwater resources

- Annual groundwater recharge: 64 km<sup>3</sup> in 2001. Approximately 2 % of rainfall across Australia.
- The average annual groundwater use is 3.5 km<sup>3</sup>. Depending on seasonal conditions groundwater comprises 22 % of Australia's annual water consumption.
- Groundwater irrigation area: 537 030 ha 2010.
- Groundwater withdrawals for irrigation 2.32 km<sup>3</sup> in 2010.



## 3. Inventory of national policies affecting agricultural groundwater use

### Recent groundwater management reforms

Reforms	Year	Scope and objective	Degree of implementation
Murray-Darling Basin Plan	2012	The Murray–Darling Basin Plan (the Basin Plan), developed by the Murray–Darling Basin Authority provides a coordinated approach to groundwater water use across the Murray–Darling Basin (the Basin). The Basin Plan limits water use at environmentally sustainable levels by determining long-term average Sustainable Diversion Limits (SDL) for both surface water and groundwater resources. The Basin Plan is the first time that a limit on groundwater use has been established across the Basin and consistent management arrangements will be applied across all the Basin's groundwater resources.	Partial

### Core groundwater management approaches at national level

Groundwater ownership	▶ Public
Groundwater entitlement characteristics	▶ Permanent, linked to land rights and transferable
Beneficiaries of entitlement	▶ Individuals, collective bodies and companies
Groundwater entitlement allocation doctrine	▶ Correlative rights

## Main types of instruments used to manage groundwater use in agriculture

### Regulatory approaches

#### Groundwater management plans

- ▶ Mandated

#### Coordination with surface water management

- ▶ Limited

#### Regulations on wells

- ▶ Approval of new wells.

#### Mandated metering or monitoring system for groundwater

- ▶ Mandated metering for agricultural and other users.

### Economic instruments

#### Groundwater markets

- ▶ Temporary entitlements are marketable.
- ▶ Long term entitlements are marketable.
- ▶ Pumped water is marketable among users.
- ▶ Water entitlement buy-outs are possible.

## Other policies and programs affecting agricultural groundwater use

Climate change adaptation programs

- ▶ Investment in agriculture R&D

Drought insurance programs

- ▶ Private insurance only

## 4. Agricultural groundwater use at the regional level

### 4.1 Great Artesian Basin (GAB)

The GAB sits under 22 % of Australia, occupying an area of over 1.7 million square kilometres beneath the arid and semi-arid parts of Queensland, New South Wales, South Australia and the Northern Territory. The GAB is Australia's largest groundwater basin and is a very complex groundwater entity. Great Artesian Basin groundwater is generally not used for irrigated agriculture though. Predominantly, it is used for stock watering, mining/coal seam gas.

Agro-climatic zone	Climate change prospective (2030-2050)	Is groundwater expected to be significantly affected by climate change in 2030-2050?	Surface Irrigation
Arid and Semi-arid	Hotter, more frequent droughts	n.a.	Surface water is available and used for irrigation. It is the dominant source of water and is mainly sourced both on-farm and off-farm.

### 4.2 Murray Darling Basin

In the Murray–Darling Basin, in particular north western New South Wales and south western Queensland there is a high reliance on groundwater. However, overall in the Murray–Darling Basin groundwater use is less than surface water. Groundwater use occurs across the entire Murray–Darling Basin with annual average extraction estimated to be 1,795GL. Groundwater represents less than 20 per cent of the total water use across the Basin and there has been a marked increase in groundwater use across the Basin since the introduction of the Cap on surface-water diversions in 1995.

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## 5. Bibliography

### Institutional websites

- [www.environment.gov.au/](http://www.environment.gov.au/)
- [www.mdba.gov.au/about-basin](http://www.mdba.gov.au/about-basin)
- [www.ga.gov.au/about](http://www.ga.gov.au/about)
- [www.csiro.au/](http://www.csiro.au/)

### Official reports

- Murray–Darling Basin Authority - Groundwater use in the Basin - [www.mdba.gov.au/media-pubs/publications/wam-report-2010-11/wam-web-2010-11/ch14](http://www.mdba.gov.au/media-pubs/publications/wam-report-2010-11/wam-web-2010-11/ch14)
- CSIRO Groundwater Hydrology - [www.csiro.au/Organisation-Structure/Divisions/Land-and-Water/Groundwater-Hydrology.aspx](http://www.csiro.au/Organisation-Structure/Divisions/Land-and-Water/Groundwater-Hydrology.aspx)
- Australian Bureau of Statistics: Water Use on Australian Farms - [www.abs.gov.au/ausstats/abs@.nsf/0/BB0DE11E964D6F28CA25788C00180058?opendocument](http://www.abs.gov.au/ausstats/abs@.nsf/0/BB0DE11E964D6F28CA25788C00180058?opendocument)

### Additional sources

- Deloitte Access Economics (2013), "Economic value of groundwater in Australia", Report for the National Centre on Groundwater Management, Melbourne.
- National Centre for Groundwater Research and Training: [www.groundwater.com.au/](http://www.groundwater.com.au/)
- National Water Commission "Groundwater Essential" [www.nwc.gov.au/\\_data/assets/pdf\\_file/0020/21827/Groundwater\\_essentials.pdf](http://www.nwc.gov.au/_data/assets/pdf_file/0020/21827/Groundwater_essentials.pdf)
- Bureau of Meteorology - National Water Account [www.bom.gov.au/water/nwa/](http://www.bom.gov.au/water/nwa/)
- CSIRO Climate Change in Australia, 2007, Technical Report. [www.climatechangeinaustralia.gov.au/documents/resources/TR\\_Web\\_FrontmatterExecSumm.pdf](http://www.climatechangeinaustralia.gov.au/documents/resources/TR_Web_FrontmatterExecSumm.pdf)
- CSIRO Water resource assessment for the Great Artesian Basin, 2012, <https://publications.csiro.au/rpr/download?pid=csiro:EP132685&dsid=DS3>
- Economic Value of Groundwater in Australia, October 2013, Deloitte Access Economics
- ABS Water Use on Farms 2009-10 4618.0
- Climate Change in Australia, Technical Report 2007, CSIRO
- Murray Darling Basin Authority [www.mdba.gov.au/what-we-do/water-planning/groundwater/groundwater-basin](http://www.mdba.gov.au/what-we-do/water-planning/groundwater/groundwater-basin)
- Murray Darling Basin Sustainable Yields Project: [www.csiro.au/Organisation-Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Sustainable-Yields-Projects/MDBSY.aspx](http://www.csiro.au/Organisation-Structure/Flagships/Water-for-a-Healthy-Country-Flagship/Sustainable-Yields-Projects/MDBSY.aspx)

This country profile was compiled by the OECD Secretariat and reflects information obtained in a 2014 OECD questionnaire on groundwater use in agriculture. Further information and analysis can be found in OECD (2015), *Drying Wells, Rising Stakes: Towards Sustainable Agricultural Groundwater Use*, OECD Studies on Water, OECD Publishing. The countries profiles for 16 countries of OECD are available for download at: [www.oecd.org/tad/sustainable-agriculture/groundwater-use.htm](http://www.oecd.org/tad/sustainable-agriculture/groundwater-use.htm)