

## COUNTRY PROFILE: AUSTRALIA

Geography: Australia comprises a land area of about 7.7 million square kilometres. Although this is just five per cent of the world's land mass, Australia is the planet's sixth largest country after Russia, Canada, China, the United States of America and Brazil. It is also the only one of the largest six nations that is completely surrounded by water. Australia is the smallest of the world's continents. It is also the lowest, the flattest and (apart from Antarctica) the driest. The highest point on the Australian mainland is Mount Kosciuszko, at 2228 metres above sea level. The lowest point is the dry bed of Lake Eyre, South Australia, which is 15 metres below sea level.

Population and land use: The population of Australia is about 25 million (2019) people with 85% of these living within 50 km of the coasts. Population density ranges from above 10,000 people per square km to less than 0.2 persons per square km in the arid centre. Human habitation of the Australian continent is estimated to have begun around 65,000 to 70,000 years ago, with the migration of people by land bridges and short sea-crossings from what is now Southeast Asia. Aboriginal Australian culture is one of the oldest continual civilizations on earth.

Climate and rainfall: Climatic zones range from tropical rainforests, deserts and cool temperature forests to snow covered mountains. Australia is the driest inhabited continent in the world; rainfall is extremely variable, and droughts are common. Australia is a relatively arid continent, with 80 per cent of the land receiving less than 600 millimetres of rainfall per year, and 50% receiving less than 300 millimetres of rainfall per year.

Food and agriculture: Agricultural businesses operate across about half of Australia's total land area. 87% of the land farmed is used for grazing and 31 million hectares are cropped. The gross value of Australian agriculture was \$60.8 billion in 2016-17 with crops accounting for \$32 billion. The dominant crops, by weight, were sugarcane, wheat, barley, oats and canola. Australia irrigates about 2 million hectares of land for cotton, rice, fruit crops, grapevines, pastures and vegetables. This varies dependent on rainfall for water supply from reservoirs. The main irrigation area is the Murray-Darling Basin (covering parts of South Australia, New South Wales, Queensland and Victoria). Water required for irrigation is stored in reservoirs in the upper reaches of the main streams and rivers and is released to downstream irrigators and environmental purposes.

Water resources management: Total consumptive use of water in 2016-17 was 16,287 gigalitres. Of this amount, 10,233 gigalitres was consumed by the agriculture; 1,483 gigalitres was consumed by the water supply services industry; a further 2,662 gigalitres by all other industries; and 1,909 gigalitres by households. Australia's average water consumption is 432 litres per capita per day.

Irrigation and drainage: The formative years of irrigation in Australia were in the 19th Century and the major irrigation developments occurred initially in the Murray-Darling Basin. In New South Wales, 500,000 ha of pastures, and 200,000 ha of rice and cotton are flood irrigated. In Victoria, 500,000 ha of pastures are flood irrigated. Major channel systems divert water from the river systems to the irrigation districts. In the south eastern Australian states of South Australia, Victoria and New South

Wales, over 100,000 ha of high value horticultural crops (citrus, grapes, stone fruit, almonds, and vegetables) are sprinkler or drip irrigated. South Australia also irrigated 60,000 ha of pastures. In other states, a similar range of crops are produced. Queensland also irrigates 140,000 ha of sugarcane. Many areas of inland Australia have been populated through irrigation development. Access to irrigation water is controlled by the government with the amount available to any irrigator, or the area that may be irrigated, regulated. Significant private irrigation regions do exist, but most regional water supply infrastructure is owned, constructed, maintained and operated by government agencies or privatised government organisations. Irrigation technology continues to evolve both at the system and farm level and to keep up to date significant investment by governments (principally via Sustainable Rural Water Use and Infrastructure Program - SRWUIP) has seen dramatic improvements in water use efficiency in systems by reducing conveyance losses (operational, seepage and evaporation) and on-farm by adoption of 'state of the art' micro, spray and surface irrigation systems. The more extensive irrigation infrastructure operators have made use of SRWUIP funding to modernise their irrigation infrastructure. Under this modernisation, old manually operated structures have been replaced with automated gates, leaky channels have been replaced by lined channels and pipelines and old-style Dethridge outlets have been replaced with modern accurate farm outlets. Many of these automated systems are so controlled that farmers are able to order water and see it being delivered to their farm offtake via computer.

Water governance: Before the 1970s, property rights to irrigation water resided largely with state governments. Since the 1970s, there has been a transfer of property rights from state governments to either individual irrigators or to collectives of irrigators that have taken over ownership and management of the distribution infrastructure. Water governance in Australia is now operating under the COAG water reform framework, it requires the development of a comprehensive system of water allocations (including water sharing plans) and entitlements. This second wave of reforms were commenced in 1994 and enhanced in 1995 when NSW, Victoria, South Australia and Queensland agreed to implement a cap on diversions as part of the Murray-Darling Basin Agreement, based on 1993-94 levels of utilisation. In 2003, COAG agreed to refresh its 1994 water reform agenda by developing a new National Water Initiative. Among other things, the Initiative set out reforms for best practice pricing and institutional arrangements. This included: Promoting the economically efficient and sustainable use of water; Giving effect to the principles of user-pays; Achieving pricing transparency; and Facilitating the efficient functioning of water markets. The Water Act 2007 was passed in 2007-2008 and Murray–Darling Basin Authority was created as a result of the National Plan for Water Security.

ICID and National Committee: Australia joined the ICID family in the year 1952 and has since then taken active part in its activities. The Irrigation Australia's Committee on Irrigation and Drainage (IACID) has organized the following events in Australia: (1) The 10th meeting of the International Executive Council (IEC), March 1959 at Canberra; (2) The 34th meeting of the International Executive Council (IEC), September 1983 at Melbourne; (3) The 4<sup>th</sup> Micro-irrigation Congress in 1988 at Albury-Woodonga; (4) The 2<sup>nd</sup> Asian Regional Conference (ARC), March 2004 at Maoma, Echuca;

(5 ) The 63<sup>rd</sup> meeting of IEC and 7<sup>th</sup> ARC in June 2012 at Adelaide; and (6) The 72<sup>nd</sup> meeting of IEC and 24<sup>th</sup> International Congress in July 2021 at Sydney, Australia. The IACID has provided the following five Vice President Honoraire (VPH) to ICID: Mr. L.R. East (1959-1962); Mr. J.S. Abbott (1982-1985); Prof. D.J. Constable (1987-1990); Dr. H. Malano (2000-2003); and Dr. Willem F. Vlotman (2009-2012). Mr. Momir Vranes is the current Chairman of the Irrigation Australia's Committee on Irrigation and Drainage (IACID). The IACID can be contacted at [info@irrigation.org.au](mailto:info@irrigation.org.au)

#### Country characteristics

(Mha = Million hectares)

Population (M): 25

Geo. Area (MSqKm): 7.7

Arable Area (Mha): 46

Average rainfall (mm): 276mm in 2019 (normal average rainfall is 465mm)

Irrigated Area (Mha): 2.274 (2018)

Drained Area (Mha): 2.15 (2017)

Sprinkler Irrigation (Mha): 0.82 (2017)

Micro Irrigation (Mha): 0.21 (2017)

(Source of above data is ICID Annual Reports, 2018 – 2019)