Adaptation to climate change for communities

The issue

Global heating is happening faster than we thought a few years ago. The latest estimate, +0.31°C per decade, is 1.6 times the rate for 2010.[1] By the 2030s, mean summer temperature in the Basin, when irrigation water demand is highest, will be at least 2°C above the 1961–90 average.[2] There will be less water for wetlands. Evapotranspiration (the rate plants lose water to the atmosphere) will increase, requiring more water to grow the same crop yield: from 10.4 to 11.8 megalitres per hectare by 2031-2050 (+12%). The extra irrigation demand for the Basin is ca. 1,800 gigalitres per year.[3] Greater evapotranspiration by native vegetation means less water available for irrigation, even if it becomes hotter and *wetter* than it is now.

What needs to be done

There is an urgent need for environmental water managers and Basin irrigation communities to adapt to the reality of less water. For wetlands, environmental triage is happening by default: wetlands that will become drylands under climate change are not being watered.[4] Some irrigators have begun to adapt, using the following approaches: 1) diversifying income sources, e.g. crop substitution; 2) adding value to produce and 3) reducing input costs.[5] Adaption needs to start now. If everyone waits until there is no other choice, adaptation becomes much harder for everyone. Specific actions include:

- Establish working group to design and implement wetland triage (States, Cth.);
- Establish regional governance arrangements and responsibilities for adaptation (States, Cth., local govt., NGOs, regional NRM bodies, communities);
- Support communities in adaptation by facilitating collective planning, learning, networking and actions (States, Cth, communities, adaptation researchers & practitioners);
- Develop a 'National Standard for Managing Water in a Changing Climate' (Cth.);
- Update water management rules to be climate-change ready (States, Cth.).

Benefits

- Reduced use of consumptive and environmental water;
- Greater community adaptive capacity;
- Building capabilities in government agencies for policy and management of adaptation;
- Improved local and regional water security;
- Sharing of climate change risks between irrigators and the environment;

What success looks like

- More resilient communities who can help each other address challenges of climate change;
- Use of adaptation pathways approaches and avoidance of maladaptive decision making;
- Communities survive and persist through more frequent and extreme droughts;
- Use of options for adaptation that can be realised now: they may not be available in the future.

References and notes

1. Ripple, W.J., Wolf, C., Rockström, J., Richardson, K., Wunderling, N., Gregg, W., Westerhold, T. and Schellnhuber, H.J. (2026) The risk of a hothouse Earth trajectory. *One Earth* 9(2), article no. 101565. https://doi.org/10.1016/j.oneear.2025.101565
2. Summer temperatures since 2018-19 have been well above average with extreme heatwaves: Clarke, B. *et al*., (2026) Climate change eclipses La Niña cooling in Australia to drive extreme heatwave and heightened fire risk. Scientific report No. 80, World Weather Attribution, London. https://doi.org/10.25560/127151. The national mean temperature for the summer of 2018-19 was 2.14 °C warmer than the 1961–90 average, breaking the previous record (+1.28 °C in 2012–13) by a large margin: BoM (2026) Australia in summer 2018–19. Bureau of Meteorology, Canberra. https://www.bom.gov.au/climate/current/season/aus/archive/201902.summary.shtml
3. Based on increase in median spring and summer irrigation water requirements (increased reference evapotranspiration ET_o × crop factor K_c – effective rainfall) of four major crops (almonds, cotton, grapes and rice) across four Basin regions under median of NARCliM 2.0 (NSW climate projections) low and high emissions scenarios (SSP1, SSP3), 2031-2050: +1.4 ML/ha (range +1.1 to +1.6 ML/ha): Petrie, P. and Hall, A. (2025) The impact of climate change on crop irrigation requirements across the Murray–Darling Basin. One Basin CRC. https://www.youtube.com/watch?v=285kYeH0Piw. Increase in Basin irrigation requirement: ca. 12,843 km^2 of the Basin area is irrigated (mean, 2010-11 to 2020-21: ABS 2011-2022, Water use on Australian farms), so × 1.4 ML/ha = 1,798 GL/year (range 1,412-2,055 GL/year), about 15% of the long-term Sustainable Diversion Limit for surface waters.
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5. Kirby, M., Bark, R., Connor, J., Qureshi, M.E. and Keyworth, S. (2014) Sustainable irrigation: how did irrigated agriculture in Australia's Murray–Darling Basin adapt in the Millennium Drought? *Agricultural Water Management* 145, 154–162. https://doi.org/10.1016/j.agwat.2014.02.013. Lesslie, E., Colloff, M.J. and Pittock, J. (2023) Walking back from the edge: thresholds of change reveal options for adaptation to water scarcity under climate change in the Murray–Darling Basin, Australia. *Regional Environmental Change* 23, article no. 154. https://doi.org/10.1007/s10113-023-02146-8