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## Australia's water shortage

### The big dry

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Rex Features



### **Australia is struggling to cope with the consequences of a devastating drought. As the world warms up, other countries should pay heed**

THE mouth of the Murray-Darling river sets an idyllic scene. Anglers in wide-brimmed sunhats wade waist-deep into the azure water. Pleasure boats cruise languidly around the sandbanks that dot the narrow channel leading to the Southern Ocean. Pensioners stroll along the beach. But over the cries of the seagulls and the rush of the waves, there is another sound: the mechanical drone from a dredging vessel. It never stops and must run around the clock to prevent the river mouth from silting up. Although the Murray-Darling is Australia's longest river system, draining a basin the size of France and Spain combined, it no longer carries enough water to carve its own path to the sea.

John Howard, Australia's prime minister, arrived here in February and urged the four states through which the Murray-Darling flows to hand their authority over the river to the federal government. After seven years of drought, and many more years of over-exploitation and pollution, he argued that the only hope of restoring the river to health lies in a complete overhaul of how it is managed. As the states weigh the merits of Mr Howard's scheme, the river is degenerating further. Every month hydrologists announce that its flow has fallen to a new record low (see chart). In April Mr Howard warned that farmers would not be allowed to irrigate their crops at all next year without unexpectedly heavy rain in the next few months. A region that accounts for 40% of Australia's agriculture, and 85% of its irrigation, is on the verge of ruin.

The drought knocked one percentage point off Australia's growth rate last year, by the government's reckoning. It is paying out A\$2m (\$1.7m) a day in drought-relief to farmers. If mature vines and fruit trees die in the coming months through the lack of water, the economic fallout will be more serious and lasting. Most alarming of all, the Murray-Darling's troubles are likely to worsen. As Australia's population continues to grow so does demand for water in the cities and for the crops that grow in the river basin. Meanwhile, global warming appears to be heating the basin up and drying it out. Although few scientists are confident that they can ascribe any individual event—including today's drought—to global warming, most agree that droughts like the present

one will become more common.

Many of the world's rivers, including the Colorado in America, China's Yellow river and the Tagus, which flows through Spain and Portugal, are suffering a similar plight. As the world warms up, hundreds of millions of people will face the same ecological crisis as the residents of the Murray-Darling basin. As water levels dwindle, rows about how supplies should be used are turning farmers against city-dwellers and pitching environmentalists against politicians. Australia has a strong economy, a well-funded bureaucracy and robust political institutions. If it is struggling to respond to this crisis, imagine how drought will tear apart other, less prepared parts of the world.

Droughts have long plagued the Murray-Darling. The region is afflicted by a periodic weather pattern known as El Niño. At irregular intervals of two to seven years, the waters of the central Pacific warm up, heralding inclement weather throughout the southern hemisphere. Torrential rains flood the coast of Peru, while south-eastern Australia wilts in drought. The duration of these episodes is as unpredictable as their arrival. They can range from a few months to several years. As a result, the flow of the Darling, the longest tributary of the Murray, varies wildly, from as little as 0.04% of the long-term average to as much as 911%. Although the most recent El Niño ended earlier this year, it has left the soils in the basin so dry and the groundwater so depleted that the Murray-Darling's flow continues to fall, despite normal levels of rainfall over the past few months.

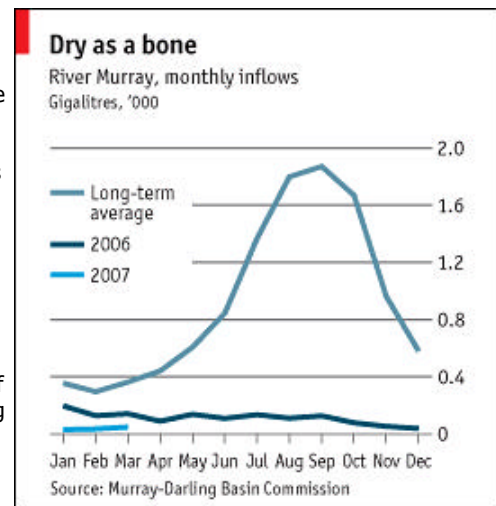
Protracted droughts are a part of Australian folklore. Schoolchildren learn a hackneyed Victorian poem in praise of "a sunburnt country...of droughts and flooding rains". Dorothea Mackellar wrote those lines just after the "Federation drought" of the late 1890s and early 1900s. The recession that accompanied it was so severe that it helped nudge Australia's six states, at the time separate British colonies, into uniting as a federation, or commonwealth, as Australians tend to call it.

## Water politics

Negotiations over the federal constitution almost foundered on the subject of the Murray-Darling. South Australia, at the mouth of the river, wanted it kept open for navigation to the hinterland, allowing the state to become a trading hub. Its capital, Adelaide, also depended on water piped from the Murray to keep its taps running—as it still does. Further upstream, Victoria and New South Wales wanted to build dams to encourage agriculture. Queensland played little part in the row, since its stretch of the Darling was sparsely populated at the time. In the end, Victoria and New South Wales agreed to ensure a minimum flow to South Australia and to divide the remaining water equally between themselves. Like their counterparts elsewhere in the world, Australian engineers gaily pockmarked the basin with dams, weirs and locks, with little thought for what that would do downstream.

By the 1990s the drawbacks were evident. For one thing, states were allowing irrigators to use too much water. By 1994 human activity was consuming 77% of the river's average annual flow, even though the actual flow falls far below the average in dry years. The mouth of the river was beginning to silt up—a powerful symbol of over-exploitation. Thanks to a combination of reduced flow and increased run-off from saline soils churned up by agriculture, the water was becoming unhealthily salty, especially in its lower reaches. The tap water in Adelaide, which draws 40% of its municipal supplies from the river and up to 90% when other reserves dry up, was beginning to taste saline. The number of indigenous fish was falling, since the floods that induce them to spawn were becoming rarer. Toxic algae flourished in the warmer, more sluggish waters. In 1991 a hideous bloom choked a 1,000km (625 mile) stretch of the Darling.

Such horrors stirred indignation among urban Australians. The bad publicity put tourists off river cruises, fishing trips and visits to the basin's various lakes and wetlands. Many small businesses got hurt in the process. The citizens of Adelaide, which contains several marginal parliamentary seats, began to worry that the taps would run dry. Farmers were also starting to fear for the security and quality of their water supplies.





So Australia embarked on a series of reforms that in many ways serve as a model for the management of big, heavily exploited rivers. New South Wales, Victoria and South Australia agreed to cap the amount of water they took from the river and to keep clear, public records of water-use rights. They also made plans to reduce salinity and increase "environmental flows". The commonwealth agreed to encourage this by allocating buckets of cash to compliant states. All these initiatives were to be managed by a body, called the Murray-Darling Basin Commission, in which the commonwealth and the various riparian states, including Queensland and the tiny Australian Capital Territory (ACT), had equal representation and where decisions were taken by consensus.

Moreover, Australia's politicians also agreed to a set of principles by which water should be managed throughout the country. There should be no more subsidies for irrigation. Farmers should pay for the maintenance of channels and dams. For each river and tributary, scientists would calculate the maximum sustainable allocations of water and states would make sure that extractions did not exceed that figure. To ensure that such a scarce resource was used as efficiently as possible, water should be tradable, both within and between states. And the minimum environmental flows necessary to keep the river in good health should be accorded just as high a status as water put to commercial uses.

Guided by these principles, the states and the commonwealth have made much progress. By 1999 the average salinity of the river in South Australia had fallen by over 20%. In the late 1990s salinity levels were falling within the prescribed limit over 90% of the time, compared with roughly 60% in the 1970s and 1980s. The construction of fish ladders around dams and weirs, and the release of extra water into important breeding grounds, has spawned a recovery in native species. The commission is spending A\$650m to boost environmental flows, mainly by stemming losses from irrigation, and hence leaving more water in the river.

The trade in water has taken off. There are two basic sorts of transaction: sales of part of a farmer's water allocation for the year or a permanent transfer. Temporary exchanges between farmers in the same state topped 1,000 gegalitres (220 billion gallons) in 2003, or around a tenth of all water used for agriculture. That roughly matches the cumulative amount of water that has changed hands permanently within the same state.

Meanwhile, the commission has codified rules for trading water between users in different states. The volumes are much smaller, but the system is working as economists had hoped. In general, water is flowing from regions with salty soil to more fertile ones; from farms that are profligate with water to ones that are more efficient; and from low-value crops to more profitable ones. In particular, struggling dairy and rice farmers in New South Wales and Victoria have sold water to the booming orchards and vineyards of South Australia. A government assessment of a pilot scheme for interstate trade determined that such shifts prompted A\$767m of extra investment in irrigation and food-processing between 1997 and 2001. Another study found that water trading helped to reduce the damage wrought by droughts.

But there are lots of problems. For one thing, the reforms concern only water that has already reached the river. Farmers in certain states can still drill wells to suck up groundwater, and tree plantations absorb a lot of rainwater that would otherwise find its way into the river. Little dams on farms, which block small streams or trap run-off from rain or flooding, are an even bigger worry. Little is known about how many there are or how fast their numbers are growing. In theory, most states are trying to regulate them, but the rules are full of loopholes and enforcement is difficult. Hydrologists fear that the severity of the drought has encouraged farmers to build more dams.

Some states are keener on the reforms than others. In 1995, when New South Wales, South Australia and Victoria agreed to cap the amount of water they took from the river, Queensland refused to join them on the grounds that it

uses only a tiny share of the basin's water. The state government felt it had a right to promote irrigation along its stretch of the Darling to bring Queensland to the same level of agricultural development as the other states. It has since agreed to negotiate a cap. But earlier this year, despite the ongoing drought, it awarded new water-use rights to farmers on the Warrego, one of the tributaries of the Darling.

New South Wales, meanwhile, frequently exceeds its cap. Its farmers plant mainly annual crops, such as rice and wheat, instead of perennials like fruit trees or grape vines. If there is not enough water to go round, its farmers may suffer for a season, but their earnings are not permanently diminished. So the state tends to be less cautious in its allocation of water than Victoria or South Australia. However, the commission has no power to ensure that states stick to their caps. It can only denounce offenders publicly, in the forlorn hope that the shame will induce them to behave better.

Climate change is likely to exacerbate all these disputes. The Commonwealth Scientific and Industrial Research Organisation (CSIRO), a government agency, estimates that it could reduce the Murray's flow by as much as 5% in 20 years and 15% in 50 years. But other projections are much more cataclysmic. CSIRO cites a worst case of 20% less water in 20 years and 50% in 50 years. Peter Cullen, an academic and member of the government's National Water Commission, points out that inflows to the Murray have fallen to less than half of their long-term average over the past six years. He thinks it would be prudent to manage water on the assumption that low flows are here to stay.

Mr Howard argues that the Murray-Darling Basin Commission moves too slowly to cope with all the upheaval. He wants the states to surrender their powers over the basin to the commonwealth. That will allow his government, he says, to work out exactly how much water is being siphoned off through wells and dams, and to use that information to set a new, sustainable cap on water use.

The government would also help farmers meet the new restrictions by investing in more efficient irrigation or by buying up their water rights—all without any of the typical bickering and foot-dragging that have held up collective action in the past. To entice the states to agree, he is offering to spend A\$10 billion of the commonwealth's money on the various schemes. But the advantage of adopting policies by consensus, presumably, is that they may prove more durable than anything imposed from Canberra. National governments, even in Australia, are not immune to inefficiency and bias. They are often at loggerheads with the states.

Moreover, not all Australians want to move as quickly as Mr Howard does. He faces an election later this year in which his environmental record—and particularly his lack of action on global warming—will be a big issue. Nor does the federal government have any experience of managing rivers. In a recent book, "Water Politics in the Murray-Darling Basin", Daniel Connell argues that any institutional arrangement that fails to give enough weight to regional concerns will not last.

## Running a river

Several state governments have their doubts about Mr Howard's plan. South Australia wants the administration of the river put in the hands of a panel of independent experts. Victoria, the only state to reject the prime minister's scheme outright, says that he could achieve the same goals without any extra powers by simply withholding money from recalcitrant states. Its government has also complained that the scheme would reward the most wasteful irrigators for their inefficiency, by helping to pay for improvements to their infrastructure and then allowing them to use much of the water saved. So the extravagant irrigators of New South Wales will end up with extra water, while their parsimonious counterparts in Victoria will benefit less.

Moreover, many Australians are uncomfortable with the idea of water trading, says Blair Nancarrow, the head of the Australian Research Centre for Water in Society, a division of CSIRO. People living in less fertile areas fear that local farmers will gradually sell all their water rights, eroding employment and commerce and killing off the area's towns. Concerned politicians have insisted on limits to the amount of water that can be traded out of regions and states each year and have refused to allow the commission to buy water directly from farmers for environmental flows. The National Party, the junior partner in Australia's coalition government, draws much of its support from the countryside and is particularly reluctant to give free rein to the water market.

In the eyes of Mr Cullen, however, many of the changes Australians fear are inevitable. As it is, he notes, the amount of money farms make for every million litres of water they use varies dramatically between states, from roughly A\$300 in New South Wales to A\$600 in Victoria and A\$1,000 in South Australia. He believes that investment and water will continue to gravitate towards the bigger, more professionally managed farms. In the long run, the irrigation of pasture for livestock, which currently consumes about half of the basin's agricultural water, will not make sense. The number of small, family-owned farms will shrink.

Ian Zadow owns just such a farm, near Murray Bridge in South Australia, which has been in the family since 1905. He is also head of the local irrigators' association. His son used to work on the farm with him. But farming cannot support two families, so the younger man has taken a job tending graveyards instead. "If you can pay all your bills and get three meals on the table," says Mr Zadow, "that's about as good as it is going to get."

At the moment however, things are nowhere near that good. Last year, he saw his allocation of water slashed first by 20%, then by 30% and finally by 40%. Next season, unless much more rain falls, he stands to get no allocation at all. He feels that city-dwellers should do their bit to help farmers by conserving more water. When push comes to shove, he says, politicians will always give priority to the cities over the countryside, since they are home to more voters. He also thinks irrigators in New South Wales and Victoria should be trying harder to save water. Before too long Mr Zadow's complaints may be echoed by millions of farmers around the world.

If the Australian drought continues, the thousands who depend on irrigation water for a living will be in deep trouble. Many are already in debt and struggling to make ends meet. When asked what will happen if there is no water for them this year, Mr Zadow hesitates for a moment before replying, "Christ knows."

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