
4 Letting markets work for the environment

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Abstract

Rivers, wetlands and floodplains are valuable ‘natural capital’ in Australia. They provide habitat for native flora and fauna, and their integrity underpins the quantity and quality of water available for drinking, and for supporting irrigated and dryland agriculture and other economically important industries including tourism and fishing. Overuse of water for irrigation undermines the long-term prospects of all these activities and water must be reallocated to the environment, especially in the context of climate change-induced shifts in rainfall and runoff patterns. Although planning is the primary tool for water allocation as set out in the National Water Initiative, and generating water savings through infrastructure investment is the preferred approach by governments, market-based instruments (MBIs) should be the most efficient and effective mechanism for achieving optimum water-sharing arrangements in the severely-stressed Murray–Darling Basin. This paper explores the role of MBIs and administrative mechanisms for environmental water recovery, some institutional and regulatory impediments to water reallocation, and how these need to change so that markets work for the environment.

4.1 Water — the lifeblood of a dry continent

Rivers, wetlands and floodplains are valuable ‘natural capital’ in Australia. They host a diverse profusion of natural, cultural and economic values. In the Murray–Darling Basin, they have evolved to be perfectly adapted to the ‘droughts and flooding rains’ that characterise much of southern Australia. Wetlands like Hattah Lakes on the Murray River provide refuges for native plants and animals during droughts when rivers can run dry. When rains return, plants and animals recolonise

the river channel and spill out onto the floodplain in a frenzy of biological productivity that continues until the cycle enters another dry spell.

The rivers of the Murray–Darling Basin provided such an abundance of food and fibre that it supported one of Australia’s largest Aboriginal populations prior to European colonisation,¹ and they underpinned an agricultural revolution as they were dammed, diverted, regulated and used to capture, store and provide water upon demand for irrigated agriculture. Seventy per cent of Australia’s irrigated agriculture takes place in the Basin, contributing greatly to the 40 per cent of Australia’s total agricultural output that originates there — an extraordinary feat, considering that the Basin receives only 6 per cent of Australia’s rainfall.² The Basin supports an enormous amount of economic activity that depends directly on a healthy environment, including tourism, real estate and commercial and recreational fishing.³

4.2 Decline of our natural capital

Despite the importance of this natural capital, a legacy of poor decision-making has resulted in the waters of the Murray–Darling Basin becoming grossly overused, and the system is collapsing. Native fish, birds and trees, and indeed whole ecosystems, are in decline. Water quality is under threat from salinity and blue-green algal outbreaks, affecting its utility for irrigation and drinking water. Many wetlands and floodplains along the Murray have not seen water for more than a decade and are literally dying for a drink.

Today, the average flow at the mouth of the River Murray is less than 25 per cent what it was before regulation⁴ and flow ceases 40 per cent of the time compared with 1 per cent of the time, pre-development.⁵ As the impacts of overuse are progressively compounded by the ongoing drought, Lakes Alexandrina and Albert and the Coorong wetland at the end of the Murray–Darling system may permanently lose the values for which they are internationally significant, and South

¹ See chapter 2 in Sinclair, P. 2001, *The Murray: A River and its People*, Melbourne University Press.

² See Murray Darling Basin Commission at: http://www.mdbc.gov.au/about/basin_statistics

³ *ibid.*

⁴ Murray Darling Basin Commission 1995–2004, *Water Audit Monitoring Reports*,: http://www.mdbc.gov.au/naturalresources/the_cap/the_WAM_report.htm

⁵ CSIRO (Commonwealth Scientific and Industrial Research Organisation) 2008, *Water Availability in the Murray, Murray-Darling Basin Sustainable Yields Project*, Australian Government Water Fund, July, <http://www.csiro.au/files/files/plos.pdf>

Australians may be left dealing with the legacy of a toxic waste dump cause by acidification.^{6,7}

It is abundantly clear how we got into this situation and that the situation will only get worse as the impacts of climate change start to bite.⁸ In its most basic form it is also clear what needs to be done to fix the problem — reallocate a substantial amount of water back to the environment from irrigation. It is in the discussion around how much water should be reallocated, where it should come from, how quickly the reallocation should happen, and which policy tools should be used for reallocation that the pathway to a healthy Murray–Darling Basin and ecologically sustainable irrigation industries becomes less than clear.

4.3 What the Basin needs

A scientific study in 2003 concluded that returning 1500 GL (about three times the volume of water in Sydney Harbour) to the River Murray, combined with infrastructural and operational improvements, would give the river a ‘moderate’ chance of becoming a healthy working river.⁹

In 2006, record low inflows to major water storages in the southern part of the Basin prompted the then Prime Minister, John Howard, to commission the CSIRO to undertake a ‘sustainable yields’ study. This study was to estimate the current and likely future (up to 2030) water availability in each catchment and aquifer across the entire Murray–Darling Basin, under best, worst and most likely climate-change scenarios and other activities that might reduce inflows, such as plantation forestry, farm-dams and groundwater extraction.¹⁰ Given that the most likely climate-change scenarios will see inflows reduce by 8–14 per cent and the worst-case scenario will see inflows halve, it is clear that a huge change in water use across the Basin is required.

⁶ South Australia Murray-Darling Basin Natural Resource Management Board 2008, *Lakes Alexandrina and Albert Ecological Condition Progress Report*, April.

⁷ Muller, K. 2008, A Blueprint for the Survival of the Lakes and Coorong Ecosystem, Indigenous Peoples and Farming Communities. Appended to: http://www.acfonline.org.au/default.asp?section_id=62

⁸ Various CSIRO Sustainable Yields Project Reports at: <http://www.csiro.au/partnerships/MDBSY.html>

⁹ Ecological Assessment of Environmental Flow Reference Points for the River Murray System Interim Report prepared by the Scientific Reference Panel for the Murray-Darling Basin Commission, Living Murray Initiative, October 2003, http://www.thelivingmurray.mdbc.gov.au/reports/srp_reports

¹⁰ See: <http://www.csiro.au/partnerships/MDBSY.html>

4.4 The National Water Initiative — Australia’s national blueprint for water reform

The story of the Murray–Darling Basin is repeated across Australia: many of our rivers and aquifers show a marked ecological decline, driven by water overuse and exacerbated by drought. Governments first acknowledged that the problem required a national approach in the early 1990s and embarked on a pathway of reform through the Council of Australian Governments (COAG). This program of reform was expanded, refreshed and propelled up the national agenda in 2004 with the introduction of the National Water Initiative (NWI), a blueprint for water reform, signed by the Federal Government and all State and Territory governments.¹¹

Despite widespread support from stakeholders, the NWI failed to drive change at the scale and pace required, as exemplified by the initial failure of the subsidiary ‘Living Murray’ program, an intergovernmental agreement involving the Federal Government and the governments of NSW, Victoria, South Australia and the ACT in agreeing to invest \$500 million¹² over five years to recover 500 GL of water for the environment.¹³ A focus on investing money in water infrastructure and on-farm efficiencies that would reduce seepage or evaporation and provide ‘water savings’ that would be returned to the environment resulted in very slow progress in water recovery — such projects have long lead-times and even when all cost-efficient opportunities are exhausted they will be able to secure no more than three fifths of the target 500 GL.

This precipitated another historic landmark in water reform on Australia Day in 2007, when Prime Minister Howard announced a \$10 billion, 10-year ‘National Plan for Water Security’ (NPWS) intended to enhance and reaffirm the NWI and to provide adequate funding to drive it. The essential elements of that plan survived the change in Federal Government later that year and became further enhanced in the \$12.9 billion ‘Water for the Future’ plan.¹⁴ This comprises a \$3.1 billion ‘Restoring the Balance’ program to purchase water entitlements from willing sellers,¹⁵ from which an initial \$50 million was quickly spent in recovering 35 GL

¹¹ See the full text of the Intergovernmental Agreement on a National Water Initiative and related resources at: <http://www.nwc.gov.au/nwi/index.cfm>

¹² Now \$700 million after a further commitment by the Federal Government in the 2006 Budget.

¹³ The ‘First Step’ of the Living Murray Initiative (LMI): More details see: <http://www.thelivingmurray.mdbc.gov.au/home>

¹⁴ See: <http://www.environment.gov.au/water/index.html>

¹⁵ Wong, P. (Minister for Climate Change and Water) 2008, Water for the Future, Speech to the 4th Annual Australian Water Summit, Sydney Convention and Exhibition Centre, 29–30 April, <http://www.environment.gov.au/minister/wong/2008/pubs/sp20080429.pdf>

of water for the environment in early 2008,¹⁶ and a \$5.8 billion ‘Sustainable Rural Water Use and Infrastructure Program’ to be spent in improving the efficiency and productivity of water use and management.¹⁷

It also promises an independent Murray–Darling Basin Authority which will develop a ‘Basin Plan’ characterised by scientifically-credible, ecologically-sustainable diversion limits on water use combined with environmental watering plans, designed to secure the long-term needs of river and wetland assets and system-wide biological processes.

Finally, it looks as if all the essential elements are in place to efficiently and effectively implement the NWI and most importantly to reallocate water to the environment and put the Basin onto a sustainable footing, at least as far as water extraction levels are concerned.

4.5 Markets to the rescue?

The NWI (Section 23) seeks to achieve a ‘nationally compatible, market, regulatory and planning based system’ for water management. In terms of planning tools for water allocation, however, the NWI essentially allows existing, State-based water-sharing arrangements to continue until their expiration dates, which for most of NSW is 2014 and for some Victorian rivers is 2019! A multitude of regulatory mechanisms exist relating to water extraction and use but none is directed squarely at addressing overuse and reallocating water from irrigation to the environment. This is unlikely to change, given the prevailing mood amongst governments and industry that regulation is not the preferred tool for achieving environmental or sustainability outcomes. That leaves the market as the key tool for water reallocation, consistent with the development of private property rights as enshrined in the NWI.

Section 79(ii) of the NWI is very clear that acceptable mechanisms for recovering environmental water include ‘the purchase of water on the market, by tender or other market-based mechanisms’.¹⁸ This clause has generated a flurry of research, modelling and advice from government and non-government bodies, including the Productivity Commission,¹⁹ ABARE,²⁰ the Business Council of Australia²¹ and

¹⁶ See: <http://www.environment.gov.au/water/mdb/entitlement-purchasing/index.html>

¹⁷ Water Under Pressure. Australia’s Man Made Water Scarcity and How to Fix It. See: <http://www.bca.com.au/Content.aspx?ContentID=100665>

¹⁸ See: <http://www.csiro.au/partnerships/MDBSY.html>

¹⁹ Rural Water Use and the Environment: The Role of Market Mechanisms at: <http://www.pc.gov.au/study/waterstudy/finalreport/index.html>

Land and Water Australia,²² all of which concluded that MBIs are the most efficient and cost-effective way to recover water for the environment.

Using the market to recover environmental water is fair to farmers, who are free to choose whether or not they wish to sell their water or enter into agreements to share water with the environment. They can sell their water during hard times to get out of debt, they can use the money to invest in more efficient irrigation technology or switch to dry land farming, or they can leave the land if that is what they want to do.

4.6 Market-Based Instruments (MBIs) that are suited to water recovery

MBIs that could be used for water recovery are many and varied. Some relate to the purchase of rights on a permanent basis (entitlements) or a temporary basis (annual allocations). The purchase of entitlements will be a key tool in redressing the balance of grossly over-allocated systems and providing base flow for rivers, but it may also be kept in storages and accumulated to provide ecologically-useful volumes. Buying annual allocations may provide opportunities to ‘top up’ available water on a case-by-case basis, but since the environment tends to need water quite early during the irrigation season, when allocations are low, the temporary market may be less useful and more expensive than might first appear.²³

Opportunities also exist to develop markets in partial rights such as options and derivatives, as well as attenuated licences that could provide water for the environment when it needs it most, usually in wet years, while leaving legal title and an agreed share of the water with irrigators.^{24,25} The development of options, derivatives and attenuated licences allows environmental managers to manage risks better, given that environmental water demand is highly variable and peaky.²⁶

²⁰ Various papers at: http://www.abareconomics.com/publications_html/landwater/landwater_06/landwater_06.html

²¹ Water Under Pressure. Australia’s Man Made Water Scarcity and How to Fix It. See: <http://www.bca.com.au/Content.aspx?ContentID=100665>

²² See Collins and Scoccimarro 2006 at: <http://products.lwa.gov.au/files/ER061225.pdf>

²³ *ibid.*

²⁴ Analysis of a range of possible MBIs for water recovery at: http://www.acfonline.org.au/uploads/res_market.pdf

²⁵ See: http://www.nwc.gov.au/agwf/wsa/docs/File/Murrumbidgee_River_Reach_A4_Final_120907.pdf

²⁶ See Collins and Scoccimarro 2006 *op.cit.*

The variability of environmental water demand in terms of the magnitude, seasonality, frequency and duration of flood events and the different characteristics of existing and novel water products all point toward the need to secure a portfolio of water products tailored regionally to meet the water demands of environmental assets including discreet assets (including wetlands, floodplains, critical habitat areas) and system-wide processes (for example carbon and nitrogen flux throughout the system).²⁷

As well as a range of MBIs, there is a range of administrative methods that can be used to implement them which themselves affect some of the pros and cons for different sectoral interests. For example, voluntary purchase of permanent entitlements can happen in a number of ways: by the environmental manager standing in the open market; by the environmental manager making a public offer to buy a particular type of water product at a particular price; or by competitive tender or auction, where entitlement holders compete with each other to supply water to the environment. Environmental managers competing in an open market to buy water entitlements may have quite a different effect on water prices than entitlement holders competing with each other to sell water to the environment. As a result, careful consideration should be given to the choice of administrative method, as well as the choice of MBI used for water recovery.²⁸

Further, some non-market factors have a significant effect on the capacity to achieve environmental outcomes with a particular environmental water allocation. For example, the ability to carry over environmental water allocations in dams and let it accumulate until it reaches ecologically useful volumes of water must be considered as part of any environmental water recovery and management package. Studies have shown that, compared to a situation without carry-over, the ability to carry-over water up to a limit of 4.5 times the volume of entitlement held reduced by 70 per cent the amount of water needed to meet environmental demands 80 per cent of the time.²⁹

The best triple bottom-line outcomes will probably result from using a mixture of different market and non-market mechanisms for water recovery and management — principally investment in infrastructure improvement which generates water efficiency savings — put together as a package which reflects local environmental and socio-economic circumstances. Nevertheless, the market is the best way to address the core problem of over-allocated water entitlements. This

²⁷ Analysis of a range of possible MBIs for water recovery at: http://www.acfonline.org.au/uploads/res_market.pdf

²⁸ *ibid.*

²⁹ See Collins and Scoccimarro 2006 *op.cit.*

view appeared to be the wholehearted approach of the current ‘Water for the Future’ plan, given the aforementioned \$3.1 billion designated for ‘purchasing water to put back in the rivers’.³⁰ But there remains a catch.

4.7 Impediments to market efficiency

Section 60(iv)(b) of the NWI commits the parties to the agreement to ‘the immediate removal of barriers to permanent trade out of water irrigation areas up to an annual threshold limit of 4 per cent subject to review at a later date’.³¹ This is clearly a barrier to trade and likely to be a substantial impediment to the Federal Government’s ability to roll out its water purchase program, \$1.2 billion of which is scheduled to be spent over the next four budget years.

In 2007, the Murray–Darling Basin Commission’s ‘Pilot Environmental Water Purchase’ project had to delay finalising some water purchase contracts until the following year because it came up against the 4 per cent barrier. Last year, trading limits were reached in Victoria after just four months. This year, in the Goulburn-Murray Water irrigation district, the closing date for submitting expressions of interest in selling water was 4 July — four days after the start of the new water year. The outcome of the ballot will be known in mid-August, and it is likely that the 4 per cent cap will be reached in at least some districts at that time. At the time of writing the 4 per cent cap has already been reached in some districts including the Campaspe (Victoria) and the Loxton Irrigation Trust and Lyrup Irrigation Trust areas (South Australia).

This is bad for the environment, and retards the pace of water reallocation because it limits the amount of water that can be bought in these areas and constrains the ability of the Australian Government to roll out its water purchase program. It is also bad for irrigators, because it constrains the ability of willing sellers and willing buyers to do business with each other in a way that promotes adjustment to prevailing drought conditions. This means that struggling irrigators — with large debts, facing another year of low or zero water allocations and a high degree of uncertainty, who might decide that it’s time for them to retire — will be unable to sell to irrigators who want to do everything they can to maintain their permanent plantings and improve their prospects in the future. As leading natural resource management economist, Dr Steve Beare, said recently in *The Australian*, ‘with all our championing of free trade at Doha, our international trading partners might

³⁰ Water Under Pressure. Australia’s Man Made Water Scarcity and How to Fix It, *op.cit.*

³¹ See: <http://www.csiro.au/partnerships/MDBSY.html>

wonder why we impose trading quotas on water with no more justification than privileging some local economic interests over others'.³²

Incredibly, the heads of government threw away the opportunity to redress this impediment to policy implementation at the COAG meeting on 3 July 2008, when Victoria championed the vested interests of the Victorian Farmers Federation and held the other governments to the 4 per cent cap. The heads of government stated nothing more than an 'ambition to increase the cap from 4 per cent to 6 per cent by the end of 2009'.³³

It is hard to imagine why the Australian Competition and Consumer Commission (ACCC) made no comment whatsoever on the impact of the 4 per cent cap in their Position Paper, 'Water Market Rules', commenting only that 'the water market rules should accommodate the outcomes of this agreement'³⁴, in a discussion that otherwise promotes the removal of other barriers to trade. Acknowledging that the COAG agreement will stand is one thing, but failing to discuss the impacts of such an agreement objectively is another.

The only justification for trade restrictions is where it is necessary to avoid market failure, such as environmental damage caused, for example, by erosion due to excessive, unseasonal water transfer downstream.³⁵

If vested interests continue to pressure governments to put barriers in the way of reform and constrain the use of the water market and exchanges between willing buyers and willing sellers, governments will eventually need to start looking at other options to fix the problem, including the unpopular option of compulsory acquisition.

4.8 Where to from here?

An excellent opportunity for governments, in particular the Australian Government, to deliver immediate and ongoing outcomes for the environment unconstrained by the 4 per cent rule, comes from specifically targeting water held by irrigators that lie outside defined irrigation areas. This would include large parts of the Darling Basin and could include giant water holders like Cubbie Station and strategically important land and water holdings which would deliver large amounts of water to

³² Opinion Piece 'Buy Back Water to Let The River Run', *The Australian*, 14 July 2008, p. 8.

³³ See: <http://www.coag.gov.au/meetings/030708.index.htm>

³⁴ See: <http://www.accc.gov.au/content/index/phtml/itemId/834697/fromItemId/3737>

³⁵ See: http://www.acfonile.org.au/uploads/res/ACF_Submission_to_ACCC_09_05_08.pdf

the environment if it were no longer captured and used for irrigation.³⁶ Even within defined irrigation areas, if entire properties are purchased along with their water entitlements so that the entitlement remains in the water district, the 4 per cent cap is not breached. This option should be pursued vigorously.

There are scheduling issues relating to the roll-out of the buy-back program and the infrastructure programme. The changing climate will render some parts of the Murray–Darling Basin no longer suitable for irrigated agriculture. Consequently, a thorough audit of future land and water capability must be done before taxpayers’ money is spent in creating world-class irrigation infrastructure if we are to avoid creating world-class stranded assets. The water buy-back should be accelerated to tackle the overuse problem but governments should not be pressured into simultaneously investing in infrastructure improvement until an audit is completed.

Further, the Basin Plan must be informed by a detailed understanding of the hydrological needs of environmental assets across the basin: currently there is a huge information gap in this area. A first priority for the new Murray–Darling Basin Authority is to commission studies to address this so that water recovery can then be tailored to provide water of the characteristics that meet ecological needs.

Likewise there are gaps in the socioeconomic information that is necessary to inform the tradeoffs that will be made in developing and implementing the Basin Plan. Much of this is tied to future land and water capability and should be front-of-mind in conducting the audit mentioned above.

4.9 Conclusion

The NWI provides a good framework for water reform in Australia. It has the capacity to meet the needs of irrigators and the environment and accordingly was welcomed by farmers and conservationists.³⁷ Its implementation programs for the Murray–Darling Basin in particular through the ‘Water for the Future’ plan provide the funding and set the pathway for the reform agenda, but governments must stop shying away from using the reform tools that the community and water users have already agreed upon. There are only so many roads to repair and restoration — we can’t block them all! Failure to recognise this and press on with the reform agenda will further delay the reallocation of water necessary to achieve a sustainable

³⁶ See: http://www.acfonline.org.au/uploads/res/Opportunities_to_purchase_water_properties_in_the_Darling_Basin_Aug08.pdf

³⁷ Press release by Australian Conservation Foundation, National Farmers Federation and the Australian Bankers Association, 23 June 2004, at: <http://www.bankers.asn.au/default.aspx?ArticleID=569>

balance. Delay reduces the time available for transition and means that we will have to deal with the double whammy of entrenched overuse and the impacts of climate change at the same time.

Leaders must allow markets to work for the environment and fast-track the use of MBIs for water recovery. Market participation on behalf of the environment means that the Australian Government can secure multiple, lasting community benefits and further a major objective of the NWI by returning water extraction to sustainable levels and enable adjustment in the rural sector. Failing to do so is consigning our internationally significant wetlands and their wildlife to a future almost as uncertain as that of our important irrigation industries that must get themselves onto a sustainable footing or face the consequences of a declining natural resource base that will be unable to support the industries that rely on it.