# Evolution of Australian Water Law and the National Water Initiative Framework

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Case Study

Final Report on Political Economy of Water Markets

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# Evolution of Australian Water Law and the National Water Initiative Framework

## A Case Study for the Political Economy of Water Markets Project

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**Megan Dyson**[i]

[i] Environmental Law and Policy Consultant, 1 Yalanda Street, Eden Hills, South Australia 5050, megan.dyson@bigpond.com.

## Preface

This paper is one output of a project entitled "The Political Economy of Water Markets." The project was carried out by Ecosystem Economics LLC and AMP Insights LLC. The outputs of the project include a final report and a set of case studies.

The final report comes in three parts:

1. "Healthy" Water Markets: A Conceptual Framework by Bruce Aylward, David Pilz, Megan Dyson and Carl J. Bauer
2. Political Economy of Water Markets in the Western United States by Bruce Aylward, David Pilz and Leslie Sanchez
3. Comparative Analysis of Legal Regimes with Respect to Fostering "Healthy" Water Markets by David Pilz, Megan Dyson, Bruce Aylward, Carl J. Bauer and Amy Hardberger

The eight case studies consist of the following.

1. The Evolving Water Market in Chile's Maipo River Basin by Carl J. Bauer
2. Addressing Overallocation and Water Trade in New South Wales, Australia: Namoi Basin Groundwater by Megan Dyson
3. Evolution of Australian Water Law and the National Water Initiative Framework by Megan Dyson
4. Opportunities for Surface Water Right Marketing in Idaho's Rapidly Urbanizing Treasure Valley by Jeff Fereday
5. Texas Groundwater Markets and the Edwards Aquifer by Amy Hardberger
6. Oregon's Umatilla Basin Aquifer Recharge and Basalt Bank by Martha Pagel
7. Truckee-Carson Surface Water Markets in Northern Nevada by Leslie Sanchez, Bruce Aylward and Don Springmeyer
8. Smart Markets for Groundwater Trading in Western Nebraska: The Twin Platte by Richael Young

The studies and reports can be downloaded from the AMP Insights website at http://www.ampinsights.com/rock-report.

For further information on this work please contact Bruce Aylward at bruce@ampinsights.com.

## Acknowledgements

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## Author

Megan Dyson is a sole practising lawyer specialising in environmental law and policy. Megan Dyson is one of Australia's foremost water policy lawyers, advising the Australian Federal Government and various Australian State Governments on reform and implementation of new water laws for more than 20 years. Megan has been a key adviser on many of the important legal changes in Australian water resource management since 1995, including implementation in South Australia of 1995 national water reforms, and the 2004 National Water Initiative (NWI). The NWI continues to guide change in Australian water rights, and was a driving force for the Australian Government's intervention in management of the Murray-Darling Basin in 2008. Megan was engaged by the Australian Government to help draft changes to federal law that provide the legal basis for its role in water management in the Basin.

## Author's Note

The case studies for this project include two papers on the Australian experience. The first paper (the current paper) is an overview of the evolution of Australian water rights from common law to statutory rights, and the current framework for water management as set out in the National Water Initiative (NWI) and applied within the Murray-Darling Basin states. The paper examines how NWI principles have been applied to address overallocated resources in the Basin and to facilitate water trading in the Basin. It then outlines the role of the federal Water Act 2007 and the Murray-Darling Basin Plan in establishing sustainable diversion limits and ensuring a consistent Basin-wide framework for water entitlement trading. The second paper outlines current New South Wales water law, and explores how an overallocated groundwater resource in the Murray-Darling Basin – the Upper and Lower Namoi – was set on the path to a sustainable extraction level. It goes on to look at trading of water entitlements and allocations in that New South Wales groundwater resource.

The two parts together illustrate that key factors in the evolution of Australian tradable water rights and active markets in those rights – particularly in the Murray-Darling Basin states – have been and continue to be, particular features of the Australian political and institutional, legal, environmental and cultural context. Characterizing the Australian experience through those features might be useful in deciding whether, how, and to what extent, water resource management models operating in Australian states could be adaptable to other contexts.

Throughout the paper quantities are expressed in metric, in some cases with the US equivalent in parentheses. One megalitre (ML) equals roughly 0.8 of an acre-foot. In other words a megalitre is slightly less in volume than one acre-foot. One gigalitre (GL) is 1000 ML or 800 acre-feet, though to simplify you may approximate and say that 6 GL is somewhat less than 6,000 acre-feet. Currency is in Australian dollars (unadjusted for inflation). At May 2016, 1.00 Australian dollar approximates 0.75 US dollar.

# Introduction

Drought, and the pressure it bears on communities, is no stranger to Australia. The 7-year Federation Drought, beginning in 1895 and causing the death of countless livestock through lack of water and severe bushfires, formed the backdrop for the creation of Australia as a federation of states. The Millennium Drought 100 years later lasted twice as long (1996-2010) and drove a fundamental change in the nature and extent of federal involvement in water resources of the Murray-Darling Basin.

Managing water scarcity has always been an important theme in Australian political and cultural life. The evolution of legal frameworks over the last 30 years or so has been marked by milestones of national or at least multi-state agreement about water management policy. While the approaches in each Australian state remain distinct, they are based on common fundaments and therefore the similarities are far more important than the differences.

# Australia – a brief overview

To understand why Australian water laws have evolved into their current form, it is necessary to understand a little bit about Australia's geography, and its legal and political governance.

## Geography

Australia's land mass (not counting its external territories) is nearly 7.7 million $km^2$ (2.9 million square miles), spanning 4,000 kilometres (2,480 miles) east to west. Its population of 24 million people are concentrated mainly in coastal cities on the eastern and south-eastern edges, with only 2% of the population living in the arid interior.

## Australia is a federation of States

The Australian continent was progressively colonised by the British between the late 1780s and early 1800s. On 1 January 1901, the then 6 colonies federated to become the Commonwealth of Australia. Upon federation the colonies became States of Australia. Today, Australia is made up of 6 states and 2 self-governing territories. About 570 local government bodies also exist, empowered by their relevant states, with locally elected members and limited power to make by-laws for local issues. Local governments are typically responsible for local roads, waste collection and the provision of community facilities.

The Australian Constitution governs the federal structure and establishes the relationship between federal and state powers. Prior to federation, each state was sovereign, and had its own constitution. The Australian Constitution guarantees the continuation of the states and preserves their constitutions. Broadly, the result is that each state has retained plenary power to legislate on any subject relevant to that state. The Australian Parliament on the other hand may legislate only with respect to the matters granted to it by the Australian Constitution. If the Australian Parliament legislates with respect to a matter for which there is also existing state legislation, then the federal law will override the state law to the extent of any inconsistency.

Importantly, the federal government levies various taxes including income tax and a goods and services tax. Revenue is largely channelled back to states in both tied and untied grants. Through tied grants in particular, the federal government maintains a degree of control and influence over areas on which it does not necessarily have clear constitutional power to legislate.

Australia has a history of co-operative federalism, leading to policy agreement and common action by the state and federal governments on a wide range of matters. The primary intergovernmental forum is the Council of Australian Governments (CoAG), comprising the Australian Prime Minister (as Chair of CoAG), heads of each state and territory government and the president of the Local Government Association. CoAG's role is to promote a common approach to policy reforms that are of national significance and need co-ordinated action by all governments. The federal government has exercised its influence both through policy leadership, but primarily and to great effect, through tied funding agreements with states.

Co-operative federalism has extended into environmental management, with the cornerstone *Intergovernmental Agreement on the Environment* being signed by the federal government and governments of all states and territories in 1992. Principles of ecologically sustainable development, and the need to ensure co-operative arrangements to conserve and improve Australia's biota, social and water resources, underpin the agreement.

## Westminster system of government

Each state, and the federal government, operate under a Westminster system of government, with all but one state parliament being bicameral. The party holding the majority of members in the lower house, or which can forge sufficient support through alliances with other parties or independent members of parliament – forms the Executive branch of government. The Executive is responsible for governing, including the administration of laws passed by that jurisdiction's parliament.

The Executive appoints from among the members of parliament various Ministers, whose role is to be accountable to the Head of State (heads are appointed by the Queen – a Governor for each state and Governor-General for the Commonwealth of Australia ) via a Cabinet of Executive members, for the administration of a particular portfolio area of government. The 'environment' is typically such a portfolio: the Minister for Environment is responsible for administering laws relating to the environment and for implementing the Executive's policies. A Department of public servants services each Minister's portfolio.

## Law in Australia – common law and parliament-made laws

A consequence of Australia's colonial heritage was the automatic application of British common law, including in relation to water.

State parliaments have plenary power to legislate, and may do so (and have done so) in a way that modifies or removes common law rights.

The Australian federal parliament may also legislate to remove common law, but only within the scope of its constitutional powers. An important limit is a constitutional provision that federal laws may be made with respect to 'the acquisition of property on just terms from

any State or person for any purpose in respect of which the Parliament has power to make laws' (Australian Constitution, section 51(xxxi)). Further, the Australian parliament does not have explicit constitutional power to legislate with respect to the management of water or other natural resources, and the states have jealously guarded their jurisdiction in this area.

## Murray-Darling Basin

The Murray-Darling Basin is Australia's largest surface water drainage basin, a region of about 2.4 million square kilometres (410,000 square miles) west of Australia's longest mountain range, the Great Dividing Range. The Basin contains Australia's three largest rivers – the Darling and Murrumbidgee, both joining the Murray in the southern end of the Basin. The Darling River is an intermittent tributary of the Murray, bringing monsoon-driven floodwaters from the rivers of southern Queensland and northern New South Wales as well as flows from smaller New South Wales rivers. The rivers flow west before joining the Murray River, which then turns south to meet the Southern Ocean at Goolwa in South Australia.

Beneath the Basin are groundwater resources - numerous alluvial groundwater basins, artesian resources and fractured rock aquifers.

The Murray-Darling Basin covers most of inland New South Wales and Victoria, and significant areas of Queensland and South Australia, and contains nearly 10% of Australia's population. The Basin produces more than one third of Australia's food, much of it from irrigated agriculture and horticulture. Common irrigated crops are rice, fodder for milk, orchards (fruit and nuts), grapes and vegetables.

Total surface water flows in the Basin average 32,553 GL (about 26 million ac-ft) per year but this is highly variable (MDBA 2012, CSIRO 2008). It is estimated that the sustainable diversion limit for surface water is 10,873 GL per year (9 million ac-ft). Total sustainable groundwater yield is roughly estimated at 3,000 GL (2.4 million ac-ft) (Murray-Darling Basin Plan).

Forming the boundary between New South Wales (NSW) and Victoria, and finding its way through semi-arid areas of South Australia to the sea, the Murray River was an important navigation route during the 1800s. Irrigation districts were established in South Australia and Victoria by the Canadian Chaffey brothers in 1887, keen to adapt elements of their successful Californian irrigation settlement to the Murray River in Australia. This marked a rapid increase in development of the potential of the river and its connected tributary systems in NSW and Victoria.

## Murray-Darling Basin Agreement

The Federation Drought was not only the backdrop for Australian federation but also the driver for South Australia, NSW and Victoria to negotiate formal agreement about access to the River Murray and development of the available water. The three states and newly formed federal government signed the *River Murray Waters Agreement* in 1914. The Agreement was ratified by legislation in each jurisdiction's parliament, the culmination of years of difficult debate.

The Agreement was a commitment to jointly fund construction of major dams and other structures to improve the reliability of flows for both irrigation and navigation. It was also a formal agreement about the sharing of available water between the three states. The shares established then remain roughly the same today – NSW and Victoria jointly ensure a minimum flow to South Australia of 1,850 GL per year (1.5 million ac-ft) while retaining all water in their own tributaries, and sharing equally flows in the River Murray near the town of Albury, situated near the base of the Great Dividing Range from which the headwaters of the Murray and Darling rivers rise.

The Agreement also established the River Murray Commission to oversee the construction of the dams and a series of weirs and locks, and their operation in a way that would give effect to the state water shares. The Commission comprised a representative of each jurisdiction.

The infrastructure was duly built, and although the Agreement has been amended and its name changed over the years, it still forms the basis for sharing water of the Murray system between the three states. Amended in the 1980s to establish a Ministerial Council to act as a joint policy-setting forum for the party jurisdictions, and to include planning and managing for the 'equitable, efficient and sustainable use of the water and other natural resources of the Murray-Darling Basin' (Agreement, cl 1), the River Murray Waters Agreement was replaced by the *Murray-Darling Basin Agreement* in 1992. This version of the Agreement established the Murray-Darling Basin Commission in place of the former River Murray Commission, to implement the wider scope of the Agreement as well as continue the foundational role of managing the sharing and delivery of water between the party states. Two other states subsequently joined: Queensland in 1996 and the Australian Capital Territory in 2007.

## Evolution of water rights in Australia

### From common law rights to statutory rights

Australians early understood the ephemeral, unpredictable and precious nature of their water resources. Recurring droughts, highly variable stream flows and groundwater of widely varying quantity and quality drove state parliaments to assert the right of the state to control access to water resources through statutory schemes. The purpose was to enable the fair sharing of water resources, as well as to encourage development of water storages which would otherwise under riparian law have been the subject of disputes. This assertion of sovereign control over water resources began in Victoria in 1886 and over the next 30 years or so was made around Australia, and for all water resources (surface and groundwater).

In all Australian states, rights to take and use water are now statutory in nature. Common law rights in relation to taking water have been removed and replaced by these statutory rights. As water rights are entirely creatures of state statutes, they are subject to the terms of the statute under which they are granted. The statute (and therefore the terms of the right) can be amended by the relevant state's parliament at any time. There is no limit on a state's constitutional right to legislate to remove or reduce a statutory right, including

without compensation if this is parliament's intention.[1] However, courts will interpret narrowly legislation that appears to take away statutory rights without compensation.

Generally speaking a licence issued under the relevant state water law is required in order to take water.[2] Water licences are held separately from land, and do not travel with land title. Rights under a licence are subject to conditions stipulated on the licence or associated permits, and may be modified by the scheme set out under the legislation. Some rights do not require a licence: for example, the occupier of land with lawful access to a water source is generally directly permitted under state law to take water for stock and domestic use. Most states modify, or have the statutory ability to modify, the extent of that use (for example by defining and limiting the meaning of 'stock and domestic use'). Other exemptions from the need to hold a licence may be apply for different types of use, or for different resources.

## Capping surface water diversions in the Murray-Darling Basin

Until the late 1960s, state laws generally did not mandate considerations that should be taken into account in the issue of licences, and there was little or no statutory provision for concepts of sustainable yields or diversion limits. Licences were generally issued on a 'first come, first served' basis to landowners who claimed an intention to utilise the full amount of their licence. A 'use it or lose it' approach was commonly applied to minimise water-hoarding, and make unused water available to others for economic development. Licences were attached to the relevant land-holding, and were based on the area being irrigated - that is, they were not issued for a specified volume.

South Australia was the first state explicitly to impose a cap on new water licences, announcing in 1968, following a severe drought and emerging salinity issues, that it would cease to issue any new licences in respect of take from the River Murray.

Water quality and wider environmental issues arising primarily because of over-use of surface water became increasingly evident in the Murray-Darling Basin during the 1990s, and the Murray-Darling Basin Ministerial Council turned its attention to new policies to address these issues.

A widespread and prolonged blue-green algae infestation in the Darling River in 1991-92 (described as the largest ever recorded in the world) sharpened focus on the need for adequate flows, and an audit of surface water use in the Basin was carried out. The findings were alarming: even though the system was clearly already over-used, use was only on average 63% of actual permitted annual diversions (MDBC 1995). It was agreed that each jurisdiction would impose a 'cap', limiting surface water diversions to the level of development in 1993. The Murray-Darling Basin Cap (in fact a number of sub-caps covering 19 surface water areas in the Basin) was implemented in 1997 after an earlier trial. Implementation resulted in states changing their water allocation practices or removing

[1] See for example as to power of a state to reduce a statutory right: *South Australian River Fishery Association v South Australia* [2003] SASC 174 and as to the power of a state to legislate to acquire property without compensation: *Durham Holdings Pty Ltd v NSW* [2001] HCA 7.

[2] In this paper, a 'licence' documents the holder's water right, and is granted by an authority under the relevant state law.

some lesser forms of entitlements in order to ensure that long-term average diversions could be maintained at 1993 levels of use (MDBC 1996).

## Water as part of the CoAG economic reforms – 1993-1995

The timing of the Murray-Darling Basin Cap coincided with an agreement between all states and the federal government to include water resource management in a new program of national micro-economic reforms.

In 1994, CoAG endorsed a package of water reforms based on acknowledgement that many of Australia's water resources were over-allocated, over-used and inefficiently managed, causing environmental degradation and hindering economic development (the CoAG *Water Reform Framework*). Importantly, CoAG also agreed that a series of measures would be required to address the economic, environmental and social implications of future water reform: the speed and extent of reforms was explicitly acknowledged to depend on the availability of funds to facilitate 'structural adjustment' and asset refurbishment.

A CoAG Working Group was tasked with making annual reports for the next five years, detailing state and federal progress against the agreed reforms. Implementation of the reform package by states was virtually guaranteed by the generous federal funding package (which covered all reforms including in relation to competition and electricity) agreed in 1995 and totalling around $2.4 billion over ten years. Payments were conditional on reform milestones being met.

Important elements of the package dealt with water entitlements and the clarification of property rights (including entitlement trading and the making of formal allocations to the environment), institutional reforms including the separation of roles of resource management and service provision and implementation of an integrated catchment management approach to water resource management. There were also requirements for greater public consultation and education.

It is worth looking in more detail at the reforms relating to water entitlements, as they set the groundwork for the more detailed national water reforms of 2004. Specifically, states agreed that they would –

(a) implement comprehensive systems of water allocations or entitlements[3] backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality;

(b) give priority to formally determining allocations or entitlements to water, including allocations for the environment as a legitimate user of water - environmental requirements necessary to maintain the health and viability of river systems and groundwater basins would be determined on the best scientific information available;

(c) where river systems were over allocated or deemed to be stressed, make progress by 1998 to provide a better balance in water resource use including

[3] There was at this time (and still is), great variation between states in the use and meaning of the terms 'licence', 'entitlement' and 'allocation'; NWI attempted to standardise terms, with limited success.

appropriate allocations to the environment in order to enhance or restore river system health; and

(d) before permitting water harvesting for any new irrigation developments of significant scale, be satisfied that the environmental requirements of the river systems would be adequately met.

In relation to water entitlement trading, states agreed that water should be used to maximise its contribution to national income and welfare within the social, physical and ecological constraints of catchments - including through cross-border trading in locations where it was socially, physically and ecologically sustainable. Arrangements to facilitate trade were to be instituted by 1998.

While the intent of the Murray-Darling Basin Cap had been to strike a balance between consumptive and instream water uses, and to secure reliability of supply to existing entitlement holders (by halting increase in the level of development of water resources), it soon became evident that this work was essential to facilitating trade as envisaged by the CoAG reforms – capping extractions is a critical pre-condition for trade.

By 2000, all Basin states had implemented most key aspects of the CoAG water reforms, including separating water entitlements from land ownership, issuing entitlements as volume-based rather than area-based entitlements (or at least setting in train a transition process)[4], and allowing trading of both entitlements and of the water available under an entitlement in a given season. By the mid 2000s, states were also making progress on providing explicitly for environmental water requirements and providing for the qualification of water entitlements in resources deemed to be over-allocated or overused, or both.

## Addressing overallocation and overuse after CoAG reforms

The 1994 CoAG agreement saw states agree to put in place arrangements to 'rebalance' consumptive and environmental allocations in water resources that were overallocated or deemed to be stressed. NSW, Queensland and Victoria were the states most affected by this policy, and each addressed reallocation in a different way.

NSW, which had the largest number of overallocated resources, developed new water legislation to put in place a modern approach to resource management. The new legislation (*Water Management Act 2000* (NSW)) set the statutory framework for conversion of licences under old legislation to new water entitlements, simultaneously implementing the NSW Cap under the Murray-Darling Basin Agreement for surface water, and sustainable yields for groundwater. The result was that in overallocated resources, licences issued under the new legislation entitled their holder to less water than they had been entitled to under the former legislation – and in many cases, less water than they had actually been taking. The NSW approach is discussed in the companion case study of the Upper and Lower Namoi groundwater resources. NSW was not the first state to have adopted a regulatory, non-compensatory approach to claw-back, South Australia having used such

[4] The process of converting area-based entitlements to volumetric entitlements began in the mid 1960s in NSW. The last water resources in South Australia to transition to volumetric entitlements are groundwater areas in the state's southeast, where transition will be complete by the end of 2016.

methods in overallocated water resources in the late 1970s (River Murray) and again from the late 1990s (Willunga Basin and groundwater resources in the South East of the state).

## National Water Initiative (NWI) - 2004

As the ten-year funding package for the 1994 CoAG agreement approached its end, it seemed that the pace and scope of reform had not been enough. Severe and continued drought across Australia from 1996 intensified awareness of declining water resource health and the vulnerability of supply – even for critical human water needs. Water restrictions and the effects of drought on farmers, city dwellers and wildlife alike became common news items across the country: it was impossible to ignore the need for serious change. Yet as little water as was available, both governments and the community at large, including irrigators, acknowledged that it could be put to more productive use – there were clearly efficiencies to be gained by reforming the entitlements system and freeing up trade to allow water to move to its highest and best use.

The state and federal governments devised a new blueprint for water reform - the National Water Initiative (NWI) of 2004.

The NWI built on the earlier commitments, focusing on areas fundamental to achieving sustainable water resource management and effective water markets. Key elements of the NWI were water planning that made proper provision for the environment and dealing with over-allocation, and improvements in water entitlements including greater clarity about the nature of entitlements, about the size of the consumptive pool and how available water would be shared, and the creation of registers of water rights. Other features were improved and consistent standards for water accounting, metering and pricing.

Differing water terminology between states was also addressed by the NWI. The NWI explicitly recognised 'the importance of a common lexicon for water use and management', and the desirability of adopting common meanings for words and phrases used. An agreed distinction was finally drawn between water access entitlements – being an ongoing entitlement to a share of water available from an identified consumptive pool, and water allocations – the specific volume of water actually available to be taken under a water entitlement in a given season or year (NWI Schedule B(ii)). Although by 2004 some states already made this distinction, some did not, partly because unless there was a period of serious drought, annual permitted use was simply the quantity specified on the entitlement. The attempt at establishing a common lexicon was not particularly successful. Today, no Basin state uses the terms in the way they are defined in the NWI. However, when 'water entitlement' and 'allocation' are used in a context of comparison between state regimes, or in a general context, they are understood to be an approximation of those terms as defined in the NWI. Ironically, only the jurisdiction with no direct control over management of water rights has defined and used the words in language closely aligned to the NWI (Australian Government, *Water Act 2007*).

The NWI is the most ambitious and comprehensive commitment to water reform made in Australia's history. It has paved the way for continuing improvement in state water management legislation and been the driver for investments in water efficiency measures and development of water markets.

Three interrelated themes in particular form the basis for the NWI's success in bringing Australian water resource management onto a sustainable footing which encourages the highest and best use of water resources: certainty of rights, capping of diversion rights, and facilitating trade in rights.

### Creating certainty and consistency around water property rights

The NWI specifies a series of standard features of water access entitlements. At the time the NWI was agreed, many of the features were already included in some state regimes, but none incorporated all of the standard elements. The NWI stipulates that water access entitlements will:

- be perpetual rather than fixed term; however it is also recognised under the NWI that term-bound entitlements might be appropriate in limited circumstances – for example where the resource is less understood or under-developed, or where access is for a temporary purpose
- be described as a share of consumptive pool (not a fixed volume)
- be separate both from land, and from regulatory approvals enabling water use at a particular site for a particular purpose (this collection of features is loosely referred to as 'unbundling', and removes any requirement for appurtenance)
- specify the essential characteristics of the entitlement (that is, the water resource to which the right relates, and the type or category of the entitlement if relevant – e.g. urban utility, environmental, reliability category)
- be exclusive
- be able to be traded, given, bequeathed, leased or the subject of mortgage (and in this respect have similar status as freehold land when used as collateral for accessing finance)
- be able to be subdivided or amalgamated
- be enforceable and enforced
- be recorded in publicly-accessible, reliable, water registers
- clearly indicate the responsibilities and obligations of the entitlement holder consistent with the water plan relevant to the water resource
- only be able to be cancelled for breach of responsibilities or obligations
- be able to be varied, for example to change extraction conditions, where mutually agreed by government and entitlement holder
- be subject to provisions relating to access during emergencies, as specified by legislation.

A NWI-standard entitlement framework will be clear about who (that is, whether individual water users or governments) bears the risk of changes in availability of water – whether these changes are seasonal or longer term (i.e. due to climate change or natural events such as bushfire) or due to changes in knowledge about sustainable diversion limits or changes in policy.

### Limiting diversions to sustainable levels

To provide confidence that water available for use will not be undermined by environmental requirements that have not been properly defined and provided for, conveyance needs or unaccounted-for additional uses, an explicit and reliably determined sustainable diversion limit must first be established.

The NWI recognises that settling on the sustainable diversion limit (often referred to as the consumptive pool) needs to be informed by sound science, socio-economic analysis and community input – and the best way to do this is by preparing, with community input, statutory plans that specify the environmental water requirements and the management arrangements that give effect to these.

Statutory water plans should therefore set out the diversion limit and provide for management of entitlements – including the seasonal determination of water allocations to be made to entitlements - in a way that meets that limit. Under this arrangement, individual water users would accept annual allocations that varied with seasonal and longer-term changes in available water (i.e., the size of the consumptive pool as determined in accordance with rules set out in the local water management plan). The risk of any future reductions in water allocation arising from changes in knowledge about environmental water requirements would be met mostly by governments, with water users accepting the first 3% reduction in allocations. Risk from any reductions arising from future policy changes would be paid for entirely by governments. (The federal government has interpreted 'risk' in these NWI provisions to mean a loss of market value of a water access entitlement due to reduction in, or reduced reliability of, allocations under the entitlement.)

Other elements of the NWI underpin confidence in the diversion limit –

- ensuring joint arrangements where water resources are shared by states, and common arrangements where there is significant connectivity (for example between adjoining surface and groundwater resources)
- bringing all water use into the entitlements framework, or at least accounting for it (this includes so-called 'interception' activities – small farm dams and groundwater wells not otherwise licensed, capture of overland flows, and plantation forestry)
- recording, accounting for and reporting on all water use, trade outcomes, enforcement actions and environmental water management
- metering and measuring water use where there is any trading in entitlements, or where there are disputes over access to water, or when new entitlements are issued
- improving coordination of data collection, and sharing of information between states
- engaging water users and other stakeholders in preparing water plans including pathways to return resources to sustainable diversion levels.

### Creating an explicit legal framework for trade

The states also agree under the NWI to ensure that water market and trading arrangements facilitate the operation of efficient water markets, including between states, where hydrologic connections physically enable trade. Transaction costs are to be minimised, including through good information flows and, for interstate trade, compatible entitlement, registry and regulatory regimes. The needs of the environment and third-party interests are to be protected.

A set of principles for trading rules were agreed and are set out in the NWI. Trading zones are to be used where possible to minimise administrative burdens associated with assessment of impact, and water entitlement 'tagging' will be adopted as a low-impact method of trading, where appropriate.

Reforms in pricing are recognised to help encourage market mechanisms to move water to its highest and best use. States agree to improve transparency about the costs of resource management (generally absorbed but not identified by governments), ensuring pricing arrangements that would facilitate efficient functioning of water markets, and examining the feasibility of using pricing as a market based mechanism to account for positive and negative externalities associated with water use.

## Water Act and Basin Plan - 2007

### Water Act

The continuing Millennium Drought, which had started in 1996 and was the most severe on record, put unprecedented pressure on water resources and communities of the Murray-Darling Basin. The prospect of long-term climate change exacerbating this pressure compounded political and community concern. CSIRO, the national scientific and industrial research organisation, had estimated that by 2020, average annual flows in the Basin could decline by about 15% due to climate change and impacts from un-accounted-for water use such as from farm dams, by plantation forestry and of groundwater.

On the eve of Australia Day 2007, the Prime Minister announced that the federal government would put $10 billion on the table to improve water efficiency and address over-allocation in the Murray-Darling Basin. Buy-back of water entitlements for the environment alone was budgeted at $3.1 billion. Scaled up to compare to the size of the US economy (about ten times Australia's), this is roughly the equivalent of US$ 30 billion.

As the Prime Minister said at the time, it was necessary to move water diversions in the Basin – both surface and groundwater - to a sustainable footing 'once and for all'.

> "For this plan to work there must be a clear recognition by all – especially by state and territory governments – that the old way of managing the Murray-Darling Basin has reached its use-by date. The tyranny of incrementalism and the lowest common denominator must end."

There was a hitch in the plan: the federal government lacks general constitutional power to legislate for water resources. While it could develop a water law covering many aspects of the Prime Minister's plan, cobbled together from its constitutional powers to legislate with respect to external affairs, trade and commerce and corporations, the permissible scope of such a law was limited. Further, any new agency created by federal legislation for managing water resources in the Basin could not cover the full range of functions being undertaken by the MDBC, including those for sharing water in the Murray system during extreme drought.

The federal government asked the Murray-Darling Basin states to formally refer additional constitutional power.[5]

The first federal Water Act was passed in August 2007 after months of negotiations came to an end with Victoria leaving the table. 'We will not be deterred from going ahead with a national plan - it will be a less adequate national plan courtesy of Victoria,' said the Prime Minister. The Victorian government responded that the rights of Victorian irrigators and the

[5] States may grant additional power to the federal government to legislate by passing State laws 'referring' either set text, or a general description of a new power, to the federal government.

environment had not been adequately catered for, the Victorian Premier complaining that the Prime Minister had 'delivered a three-legged horse'. Victoria was alone in its dissension, the other states already having agreed to a broad referral of power.

The 2007 Water Act was based on an assortment of existing federal powers. It established a Murray-Darling Basin Authority with functions overlapping many of those of the Murray-Darling Basin Commission (MDBC), potentially setting the scene for more, not less, confusion and dispute over respective roles and responsibilities. A more subtle consequence of not achieving referral was absence of political buy-in by the states of the federal government's new role. Nonetheless, at the Act's core were the most fundamental changes in the history of water management in Australia, and a significant test of the scope of federal constitutional power. The Act tasked the Murray-Darling Basin Authority with preparing the Basin Plan to set and enforce sustainable diversion limits on all Basin water resources.

It is testament to both the extent of continuing public concern and determination of federal governments (there was a change of government in November 2007) that by early 2008, all state governments had finally agreed to a limited referral of power – a rare and significant concession to the otherwise closely guarded 'States' rights'. Whether federal legislative control was necessary to achieve the reforms or not, the magnitude of the problems faced by states, and the money offered by the Australian government, meant that the demand could not be refused.

The Water (Amendment) Act was passed in December 2008 based on referrals by all Basin states. The federally-created Murray-Darling Basin Authority replaced the MDBC as the body responsible for administration of the Murray-Darling Basin Agreement.

In order to secure referral, the state and federal governments had negotiated yet another intergovernmental compact. The *Agreement on Murray-Darling Basin Reform* of 3 July 2008 was expressed in part as a reaffirmation of the parties' commitment to the NWI and in the context of federal-state partnership. It reiterated the role of extreme drought, the onset of climate change and consequences of past decisions and practices in the great strain now placed on the Basin's water resources. It was formally accepted by states that responsibility for the Basin Plan (and therefore for setting sustainable diversion limits) would reside with the Murray-Darling Basin Authority and the federal Minister. States did achieve a say on the appointment of members to the Authority, and agreement that the Authority would in its function of administering the Murray-Darling Basin Agreement, be independent from the federal Minister and remain subject to the will of the parties through the Murray-Darling Basin Ministerial Council.

Once again, federal funds were attached to this latest agreement.

### Basin Plan 2012

The Basin Plan was developed by the Murray-Darling Basin Authority over a period of nearly four years.

The Plan was bound by the Water Act to establish sustainable diversion limits for all water resources. The Water Act is explicit about what constitutes an *environmentally sustainable*

*level of take*: the level at which water can be taken from a resource which, if exceeded, would compromise key environmental assets of the water resource, its key ecosystem functions or its productive base, or key environmental outcomes for the resource. Environmental outcomes include ecosystem function, biodiversity, water quality and water resource health.

A vast quantity of existing and newly commissioned scientific work and social and economic analysis was relied upon to determine the environmentally sustainable levels of take for Basin resources.[6] The Authority sent staff to public meetings week after week, consulting mostly farming communities in the face of strident, determined and often hostile protests.[7] The Guide to the proposed Plan, released in 2010, put forward three scenarios for reducing existing diversions across the Basin, ranging between 22% and 29% of total diversions.

Complaints were thematic – there was nothing wrong with the Basin's river systems, simply seasonal variation in rivers 'used to' long dry periods; the process had been forced on regional communities, who would be expected to wear the entire costs of reducing water use; it was a vain attempt to recover a pristine environment that was long gone.

The Basin Plan commenced on 24 November 2012, mandating a reduction in diversions of around 20%, or 2,750 GL (2.2 million ac-ft). The federal government has committed to achieving this reduction through a combination of water entitlement buy-back and infrastructure investments, for example in on-farm efficiencies such as piping earthen channel systems.

Complementing the introduction of sustainable diversion limits, the Basin Plan also requires that a water resource plan be prepared and accredited by the federal Minister for every groundwater and surface water resource in the Basin by 2019. The process is well underway as states work on refining existing plans under state law or developing new ones. The first proposed plan - for the Warrego, Paroo and Nebine rivers in the far north of the Basin - was presented by Queensland for accreditation in 2016.

The Basin Plan sets out minimum requirements for water resource plans, including requirements that will ensure protection of key environmental assets and ecosystem functions, proper accounting for interception of water by runoff dams, commercial plantations, mining and other uses, planning for environmental watering, water quality management, managing risks to water resources and managing during extreme events (i.e., drought or severe water quality events), measuring and monitoring resources, and identifying Indigenous values and uses.

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[6] See for example CSIRO (2008) *Water availability in the Murray-Darling Basin: a report from CSIRO to the Australian Government*; Murray-Darling Basin Authority (2011) *Socioeconomic Analysis and the Draft Basin Plan*; Murray-Darling Basin Authority (2011) *The proposed 'environmentally sustainable level of take' for surface water of the Murray-Darling Basin: Method and outcomes*

[7] See collection of protest materials collected by Authority staff and now kept in the National Museum of Australia: http://www.nma.gov.au/collections/highlights/murray_darling_basin_authority_collection

## Water trading rules

### Content of Basin Plan water trading rules

The Basin Plan also contains a set of water trading rules, which override any inconsistent Basin state trading rule, and apply to Basin state governments in their administration of trade, to irrigation district operators, and to individual market participants.

The trading rules aim to reduce restrictions on trade, improve transparency and access to information and improve market confidence through a more effective water market. Specifically, they:

- prohibit a raft of restrictions on surface water trade (for both regulated and unregulated systems), and stipulate minimum requirements for trade of groundwater (many restrictions had already been removed by states through the NWI reform processes); certain restrictions are permitted if necessary to achieve specific environmental or third party protections
- regulate the use of exchange rates
- prevent unreasonable restriction of trade by irrigation districts, and require irrigation districts to provide their members or customers with explicit information about water users' rights (both their water rights and their delivery rights)
- impose requirements on approval authorities in relation to trading processes, aimed at improving transparency and preventing corruption
- impose requirements on Basin states to make information about water rights and trade – including trading prices - public (information is now held on the Authority's website or accessible by link from that site).

The Basin Plan water trading rules were developed following formal advice given by the Australian Competition and Consumer Commission. The ACCC's comprehensive advice was based on an issues paper, discussion paper and draft advice in relation to which it sought submissions from stakeholders.

The ACCC found, in brief, that an effective legal framework for water trade requires (ACCC, 2010):

- clearly defined property rights
- a resource cap or limit
- addressing externalities and third party interests
- appropriate transaction costs and charges
- availability of information.

The bulk of the ACCC advice – 28 suggested rules, plus a number of other recommendations – found its way into the Basin Plan water trading rules which are now federal law.

### Defining property rights - unbundling

The ACCC advice recognised that a key feature of water reforms had been the 2004 NWI commitment to separate water access rights from both land and from water extraction approvals and use approvals. The ACCC found that where this unbundling has occurred, water users have gained greater flexibility in managing their water needs and there have been significant increases in trade opportunity.

Bundling of water rights with rights to take and use water at a particular location forces both the generic and unique aspects of each right to travel together, making it difficult to trade a right other than to a new occupier of the same piece of land wishing to take and use water under exactly the same conditions. Tying water use to particular locations or purposes fragments the market and requires lengthy impact assessment and approval processes which add to water trading transaction costs and the time take to complete a trade.

Unbundling the water right (entitlement and quantity) from the right to take and use allows the trade *of the entitlement* to progress unencumbered, particularly in regulated systems. An application to extract and use water at the new location is dealt with separately (if at all – i.e., this system also allows an entitlement owner to leave water instream). Compared with trade in bundled systems, this arrangement provides much greater flexibility and lower transaction costs.

## Current position in the Murray-Darling Basin states

### Water entitlement frameworks

The result of more than 20 years of continuous reform and significant investment by state and federal governments as well as individual irrigators is that, generally speaking in the Murray-Darling Basin states:

- water resources are managed explicitly, through legally binding management plans developed through public consultation processes
- water entitlements are held separately from land and are fully tradeable; in all regulated surface water systems in the Basin, entitlements are also further unbundled into share based entitlements with annual allocations (reflecting the water available in that year and number of shares held under the entitlement), and separate approvals for extraction and use of water
- entitlements in regulated systems and in many unregulated and groundwater systems are perpetual and may be dealt with in the same way as personal property
- entitlements are subject to qualification only in accordance with the terms of legislation, or statutory water management plans
- 'use it or lose it' policies are no longer applied
- all significant groundwater use is licensed and all groundwater use will be subject to sustainable diversion limits by 2019
- environmental water requirements are spelled out and provided for, including through management of the consumptive pool
- connectivity between surface water and groundwater resources is being progressively addressed, and will be addressed for all known significantly connected resources by 2019.

Water entitlement trading rules are part of each state's water legislation; both entitlements and annual water allocations made to those entitlements may be sold or leased. State trading rules applying specifically to a particular resource, tailored to minimise environmental and third party impacts and to ensure water take remains within the sustainable diversion limit, are set out in statutory instruments and often form part of the

relevant statutory management plan for the resource. Local trading rules are generally well understood by water users, due to the public consultation and engagement processes mandated for the development of such rules. Since 2014, state rules must also be consistent with the Basin Plan water trading rules, and all trading rules are accessible online.

### Achieving sustainable diversion limits in overallocated resources

States confirmed through the NWI their 1994 CoAG commitment that they would end known over-allocation by 2005. The federal government agreed to enter discussions with states on a bilateral basis for specific adjustment packages (that is, regional funding agreements).

In discussing 'adjustment issues' with local communities, states agreed under the NWI to focus on the higher reliability and security of water entitlements that would be achieved in exchange for lower water availability in absolute terms, and the fact that water users had benefited from past unsustainable water use. Another possible incentive to accept reductions was that once sustainable limits had been reached, the costs of any other reductions in entitlements would be explicitly and fairly shared between individual users and the government.

State processes for reducing entitlements in over-allocated systems relied on various administrative means and were achieved without payment of direct compensation. They included for example:

- A 'levy' on volumes of traded rights, under which a purchaser received only a portion of the purchased entitlement, with the remainder being returned to the non-consumptive pool. This method was applied to certain South Australian groundwater resources during the mid to late 1990s. In some Victorian unregulated rivers in 2008, a 20% reduction on traded water was imposed. It is now recognised that applying a levy on volumes of traded water imposes a disincentive on the water trading market, and the practice has been prohibited by the Basin Plan water trading rules.
- Entitlements to overallocated NSW groundwater resources were reduced annually over a ten-year reduction program implemented under statutory water sharing plans 2003-2014 – in some places involving reductions of up to 70% by the end of the program. One of the groundwater resources affected by this claw-back is the subject of the companion NSW case study.

In other areas water 'savings' have been achieved through major efficiency programs including replacing open channels with pipes and installing meters. In most cases, infrastructure replacement packages have involved sharing costs between irrigators and state and federal governments, with water saved through efficiencies being shared between irrigators and the environment. (The environmental share has either been returned to the 'non-consumptive' pool, or converted into new licences held by environmental water managers.)

The Basin Plan requires states to apply new sustainable diversion limits from 2019. The federal government will bridge the gap between existing levels of diversion and the new

limits through a $3.1 billion direct buy-back scheme and infrastructure investments of at least $2.3 billion (Australian Government 2014)..

## Water entitlement and allocation trade

Trade in water entitlements in the Basin increased dramatically from 2007, and account for 95% (by volume) of all water traded in Australia. Most of this trade takes place in regulated systems, although there is a small and steady amount of trade in unregulated systems. Groundwater entitlement trade accounts for about 12% of all trade (NWC 2014b).

Basin state water laws now generally facilitate trade, and there is a good flow of market information. Trading rules are easily accessible and generally understood, there are active water broking firms and online water registers, and trading prices are published. Water availability is the main driver of water trade activity and prices, which fluctuate according to seasonal and year-to-year availability. Between 2008 and 2013, prices for annual allocations in the Basin varied between around $44 - $350 per megalitre (approximately US$ 40 – 320/ac-ft). During the same period, prices for water entitlements varied between $1,400 and $2,100 per ML (US$ 850 – 1,200/ac-ft), reflecting the higher market value of entitlements over annual allocations (NWC 2014b).

In the 2012-13 water year, 6,058 GL (4.9 million ac-ft) of water allocations in the Basin were traded, a 44% increase since 2011-12. More than 95% of the traded volume was in regulated systems. (BoM 2014; NWC 2013). This quantity is nearly 60% of total allocations made, but includes parcels of water that may have been traded a number of times in order to reach their destination; trade being the mechanism by which water may be moved by farmers between their properties, and by which environmental allocations are delivered. Some environmental allocation trades are very large quantities, and are made by environmental water holders in order to deliver water to its intended environmental use, between different environmental water holders, private-to-environment and environment-to-private (NWC 2014b).[8]

A recent assessment by the National Water Commission concluded that the establishment of contemporary water markets and trading arrangements had been generally successful, with water trading now 'a vital business tool for many irrigators in providing flexibility to respond to variable water availability and other market factors' (NWC 2014a).

CoAG has set standards for processing times for trades in unbundled systems. For intrastate allocation trade, 90% are to be completed within 5 days (apart from South Australia, which has 10 days). Interstate allocation trade can be expected to take 10 days (or 20 for trade from South Australia). 90% of inter and intra state trade in water entitlements should be completed within 20 days. Performance against these standards is reported online.

Irrigators within districts are now legally entitled to have their district right converted to a water entitlement held in their own name, and to trade this if they wish. Irrigation districts may charge 'exit' fees, but the extent of these is regulated by the federal government's *Water Market Rules 2009*, which were made under the Water Act.

[8] For example, trades between environmental holders in Victoria 2010-11 to 2012-13 accounted for 3,197 GL of allocation. About 80% of trades into SA in 2011-12 were environmental trades.

## Current issues

### Adjustment to sustainable diversion limits – moving water from agriculture to environment

Current issues in Australian water resource management relate to adjustment from previous diversion levels to new sustainable levels.

Recovery of environmental water has been described as 'one of the most bitter debates in the country'.[9] Federal entitlement purchases are perceived to have been the death knell for some rural communities – not just in the form of stranded assets left to be maintained by a dwindling few, but in the associated loss of irrigated industry and related businesses, leading to a loss of critical mass in small townships.

Some irrigators claim that federal involvement in the market has driven up water prices. However, studies show that it is dry conditions that contribute to the lack of available water and drive price variability (Aither 2016). Modelling by some researchers has indicated that compared with the effects of drought between 2006 and 2008, there will be relatively few job losses in the Basin able to be attributed to the federal buy-back (Wittwer 2012).

The federal government has recently responded to community concern about buy-back by legislating to prevent itself from purchasing more than 1,500 GL (1.2 million ac-ft) in irrigation entitlements. The remaining water required to be recovered to meet sustainable diversion limits 1,250 GL (1 million ac-ft) will have to be recovered through schemes such as paying irrigators to undertake on-farm efficiency measures.

The Murray-Darling Basin Authority is supportive of the restriction on buy-back, noting that investment in irrigated agriculture can help mitigate the social and economic impacts of the Basin Plan on irrigation-dependent communities. The restriction is opposed by conservation groups, believing that it will severely compromise the government's ability to recover the quantity of water required to meet the sustainable diversion limits. Rural communities greeted the limit on purchases with relief. An association representing 150 local governments, businesses and community groups in the Basin said 'The effect of buybacks has been the creation of a 'Swiss cheese effect' in irrigation districts, creating financial hardship on remaining irrigators. Operational costs remain fixed with the opportunity to recover costs negatively impacted through reduced delivery. This in turn visits adverse social and economic impacts on the remaining irrigators and their communities.'[10]

In spite of difficulties and opposition from some farming communities, by 2016 more than 70% of the recovery target has already been met through a combination of market-place purchases and savings generated from government-funded investments in system and on-farm infrastructure.

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[9] Australian Broadcasting Commission, *Meet the new Murray-Darling Basin Authority boss: why he wanted the job, and what communities have been telling him*, 18 February 2016 at http://www.abc.net.au/news/2016-02-18/new-mdba-ceo-phillip-glyde/7179034

[10] Murray-Darling Association submission to Environment and Communications Legislation Committee of federal parliament, August 2015

## Water trade issues

### Extending unbundling

While unbundling of water entitlements from take and use rights has increased flexibility in trade, unbundling can be an administratively costly exercise and can unnecessarily increase the complexity of a transaction in some circumstances. South Australia is one state which has been explicit about its reluctance to further unbundle water entitlements from take and use rights in its unregulated surface water systems unless it is clearly cost effective to do so (SA Government 2014). The National Water Commission's view was that although unbundling might not be cost-effective in small water systems, or those with minimal consumptive use, generally entitlements for high use resources – including unregulated surface water and groundwater – should be unbundled (NWC 2014a).

NSW is the only state to have entirely unbundled rights to all regulated and unregulated surface water and groundwater in areas covered by water sharing plans.

### Community opposition

The expansion of water trade has not been without difficulty. A 1998 review by heads of Basin state water departments found that in some places, markets faced significant impediments and community opposition because of social, environmental and economic concerns. However, in water systems where entitlements had been capped, it was clear that the only way to allow continued development and to encourage more efficient water use was through trade of those entitlements. Trading commenced in all Basin states from the mid 1980s and was popular amongst communities relying on the relatively high-security regulated water supplies from the large dams in the Basin.

Trading of water rights out of irrigation districts was resisted by districts fearing stranded assets and rising costs for remaining irrigators. New federal laws in place since 2009 require districts to permit out-of-district trade, although 'exit' fees may be charged.[11]

### Losing the 'use it or lose it' policy and allowing 'sleeper' licence trade

Cancellation or reduction of a water entitlement if water is not used (a 'use it or lose it' policy, or requirement to prove continued beneficial use), is incompatible with the separation of water access entitlements from rights to use of water available under entitlements, and is considered actively to encourage inefficient water use. All Basin states had ceased to apply use it or lose it policies by the mid 1990s, some earlier than others.

Nevertheless, permitting trade in unused water entitlements ('sleeper' licences) was one of the issues raised with ACCC during its preparation of the water trading rules advice in 2010. Some irrigators were concerned that enabling trade in sleeper licences would result in greater use of those entitlements, reducing over-all reliability of supply. The ACCC determined that preventing trade of such licences would not be an appropriate protection of reliability, and that trading rules should not distinguish between entitlements based on their level of past use. It recommended that concerns about overuse and overallocation should be dealt with through more appropriate policy tools such as methods used by states to move to sustainable diversion limits (ACCC 2010).

[11] *Water Market Rules 2009* and *Water Charge (Termination Fees) Rules 2009*

The National Water Commission commented that although trade in unused licences might have affected reliability of supply or the environment or both, drought also drove increases in previously unused entitlements (NWC 2011).

Basin states had already grappled with the question of allowing trade in sleeper licences, during negotiation on their first agreement to cap water entitlements in 1995. An independent audit report on setting the Cap recommended that rights held by previously existing sleeper and dozer (partially used) licences be honoured (Cox and Baxter 1996). All states agreed at that time that any increase in use of licences would have to remain within the Cap. States would make their own decisions whether to cancel or reduce unused licences, or to permit growth in use, resulting in incremental reduction in allocations to those who had a history of high use.

In South Australia, sleeper licences had already been cancelled in 1979, and that state permitted a growth in use of dozer licences up to the Cap. In Victoria and NSW, both sleeper and dozer licences were honoured in implementing the Cap, mainly at the expense of a range of opportunistic (high flow, low reliability) entitlements which were progressively reduced and in some cases removed.

### 'Water barons' and speculation

Opponents to trade in water entitlements regularly raise concerns that trade will lead to hoarding and speculation by non-water users, and the issue was one of those identified by the ACCC in its trading rules advice. However, the ACCC considered that there was little evidence of such 'water baron' behaviour. The Victorian government, which had previously imposed a trade limit of 10% of total allocations permitted to be held by non-landowners (including government and non-government environmental water holders), had reached a similar conclusion and in 2009 abandoned the limit, in spite of opposition by the Victorian Farmers Federation.[12]

The ACCC advised that the Basin Plan water trading rules should explicitly prohibit restrictions on trade based on the identity of either party to a transaction, and the rule was included in the Plan (ACCC 2010, rules advice 3A; Basin Plan s 12.07).

A recent investigation by the Victorian government found that private ownership of water not tied to land has hardly changed since 2009 and is now at about 7%, with no evidence that speculators are having a significant impact on the market (Victorian Government 2016). As the study report pointed out, even speculator must sell water in order to make a profit 'Every bit of allocation needs to end up being used on farms or elsewhere, or market players will just lose their money – because their allocations cannot be held indefinitely' (Victorian Government 2016).

### Market impact of environmental water purchases

The Victorian study found that an increase in environmental water holdings – which between 2010 and 2015 had grown from 7% to 26% of northern Victorian high-reliability

[12] The VFF said that "raising the limit of water held by non-landholders increases the risks of water barons being formed and distortion of the water market. Speculative driven price particularly in years of low allocation, which if climate change causes to be more frequent, will increase the speculative opportunities." (submission to ACCC Water Market Rules Issues Paper, 2008)

water shares – had been one of the longer-term factors (together with drier conditions and other factors) tending to push up the prices of seasonal water allocations. Federal environmental water purchases between 2010 and 2015 accounted for more than 50% of all high-reliability shares purchased. However, these purchases did not reduce water use; irrigators in the Lower Murray for example almost doubled their use in the ten years between 2005 and 2015 (Victorian Government 2016).

## Conclusions

Key factors in the evolution of Australian tradeable water rights and active markets in those rights – particularly in the Murray-Darling Basin states – have been and continue to be particular features of the Australian political and institutional, legal, environmental and cultural context. Characterising the Australian experience through those features might be useful in deciding whether, how, and to what extent, water resource management models operating in Australian states could be adaptable to other contexts. The following summarises important features of the Australian context that have either enabled or driven the evolution of tradeable water rights.

### Political and institutional

Australia enjoys a strong history of co-operative federalism, including in the environmental arena. This has encouraged consistent and concerted effort by state governments in environmental reforms. Federal grant funding, tied to achieving specified environmental outcomes or implementing reforms agreed through fora such as the Council of Australian Governments, supports action by states.

Australian governments are accustomed to negotiating, signing and implementing long-term agreements – for example, the 1992 Intergovernmental Agreement on the Environment is still the relevant agreement on respective state and federal roles and responsibilities in environmental matters, and sets out essential policy principles for environmental management. The Murray-Darling Basin Agreement originates from earlier agreements dating back to 1914. It remains the formal instrument for sharing waters of the connected river systems of the southern Basin, and for pursuing joint programmes for matters such as salinity management, interstate water trade and management of the large regulating structures in the Basin.

National reforms lead by CoAG in 1994 paved the way for a modern framework for water resources management to be progressively adopted by Australian states, in particular the Murray-Darling Basin states. The CoAG economic reforms of 1994 recognised the economic value of water to Australia and the corresponding need to ensure that it was managed in an optimum way. Two key aspects of these reforms were securing the long-term availability and health of water resources, and ensuring that, through market mechanisms, those resources could move to uses which reflected their highest and best value. Recognising the economic value of water was key to governments' willingness to allocate significant attention and financial resources to the necessary reforms. The National Water Initiative of 2004 built on the CoAG 1994 reforms and set out a standard framework for managing water resources and entitlements in Australia. The NWI continues to be progressively implemented by states.

## Legal

It is significant to the way that Australian water rights have evolved that from very early days following colonisation (that is, from the early 1800s), states asserted their sovereignty over water resources. This assertion of the right to control the use of water, expressed in some states as a formal vesting of all rights to water in the Crown, has led to the removal in all states of common law rights to take water. Those rights have been replaced with statutory systems of rights in each state, enabling state governments to control and modify water access rights without the need to pay compensation. There is no constitutional constraint on a state's ability to legislate in respect of water rights.

It is also significant that in all states, a single piece of legislation covers the management, taking and use of both surface water (from watercourses as well as from overland flow) and groundwater. All forms of direct taking are covered, for all purposes. Some states are also now explicitly addressing less direct forms of take, such as interception of water by commercial plantation forests.

As illustrated by the NSW case study in the companion paper on groundwater in the Namoi Basin, particular aspects of water laws have facilitated the development of active trade in water rights.

Early limits on the use of water protected the resource and drove demand for trade. Temporary trades were permitted by state governments as emergency measures during drought periods, but from the early 1980s states began to implement legislation providing a formal framework for water trading (NWC 2011, e.g. p 41).

Specific features of current legal frameworks (in most states) that support trade in water entitlements are:

- Diversion limits – formal limits on the quantity of water that can be taken from a resource. Following the NWI, limits are set at an environmentally sustainable level based on the best available science and informed by community consultation. All users (including stock and domestic) are accounted for within the limits, and they are under continuing monitoring and review.
- Perpetual and well-defined entitlements, with variable annual volume, which are enforceable and enforced (through metering, measuring, and monitoring) mean that it is unarguable who owns how much water at any point in time. There is no avenue for dispute about the quantity owned, and therefore able to be traded or used as security, e.g. for bank loans. Public registers of water entitlement ownership enhance security and certainty.
- Explicit trading rules that are set by or under legislation. Rules are designed to protect both the environment and third parties, and are consistently applied.

## Environmental

Australia's water resources are highly variable in availability – the country experiences both drought and floods, and the climate ranges from tropical to arid. Most of the Murray-Darling Basin ranges from temperate to very dry, and all but the largest rivers are unreliable in terms of flow. Many are frequently dry during summer. The unpredictable nature of the

resource drove early legislation to regulate access, and also encouraged the construction of large public works for river regulation from the early 20th century.

Climate change has and will continue to exacerbate Australia's water supply issues. CSIRO predictions based on the 'median' climate change scenario are for a reduction in surface water availability of 14% by 2030 (from the long-term average 1895-2009).

There is widespread understanding within government and by the community generally of the importance of biodiversity and ecosystem services at a whole-of-system level, rather than environmental concerns being species-specific. The need to secure environmental sustainability has been recognised as an economic imperative (see CoAG 1994 as outlined in this paper) and the concept underpins both diversion limits (caps) and trading rules.

### Cultural and social

Australians are familiar with drought and the need to conserve water. They have accepted the role of government in regulating access to water. Indeed, this role is generally welcomed as it is understood that a strong regulatory framework enhances the value of water access entitlements by ensuring the continued availability of water in the long-term, removing the potential for disputes between water users, and enhancing the exclusivity of water rights and thereby their economic value as property rights.

Water trading has been formally provided for through legislation for at least 30 years in most states. The benefits of trade in providing flexibility to farmers is observable. It is widely acknowledged that the ability to trade water has been the saviour of many farming enterprises in times of scarcity, and particularly evident during the Millennium Drought.

Excellent information services the market, and in turn drives increasing sophistication on the part of water users in their approach to water trading. Market information includes public registers of entitlement ownership, registers of trading activity in all regions that include prices paid, national water accounts detailing annual water inflows and outflows in each system, public information about the level of allocations made to entitlements in regulated systems, and explicit trading rules. Private water brokering firms are very active.

Some of the anticipated disadvantages of water trade, such as 'water barons' hoarding water, the impacts of permitting trade in sleeper licences, and a reduction in return flows, have not eventuated or have not had any significant impact on water entitlement holders or the environment. Reasons are likely to include the fact that trade occurs within an environmentally sustainable diversion limit. Any impacts of increasing use of existing water entitlements are socialised within the allocation policy which allocates a portion of inflows. Reductions in allocations available to users caused by reduction in return flows or growth in use of previous sleeper licences are indiscernible or accepted.

The need for communities to be consulted on reductions in water availability on the path to sustainable extraction limits is a matter covered by the NWI, but the methods used have been left to states. Cap setting (and re-allocation if necessary) has been more successful in regions where there has been strong community involvement in developing diversion limits, with proper support from government scientists. While reduction in water entitlements or the volume of water allocated to entitlements is never easy, there are examples in some

states of processes which have been community driven with results that are not only environmentally sustainable but also generally accepted by water users. The contrasting experiences highlight the importance of seeking and valuing the input of affected communities.

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