

# 7

## The Australian water markets story: Incremental transformation

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### The lie of the land

The Australian water markets story is essentially a story of the Murray–Darling Basin (MDB), a major river basin in south-eastern Australia covering in excess of 1 million square kilometres. It is home to more than 2 million inhabitants, major irrigation industries, dryland farming and important environmental features.

Map 7.1 shows the key rivers and towns within the MDB. The Darling River is located in the northern MDB, which is characterised by ‘flow of the river’ extractions, which are permitted depending on the volume of water in the rivers. The Murray River is in the southern MDB, where many of the water extractions are made through irrigation systems and where the available volumes are highly dependent on water levels in large water storages.



Map 7.1 The Murray-Darling Basin

Source: MDBA (n.d.).

The water ‘market’ in the MDB is a cap-and-trade system whereby a specified volume of water can be extracted or diverted on an annual basis. A cap on surface water diversions was introduced in 1995 and, from July 2019, comprehensive caps on surface and groundwater use, called sustainable diversion limits (SDLs), will become operational as part of the MDB Basin Plan (Connell and Grafton 2011; Horne 2017b).

The water market involves two major types of trades: 1) water access entitlements, commonly known as water entitlements, which represent the consumptive share of the water resources within a catchment defined by a water resource plan; and 2) water allocations that are the physical volumes of water assigned to water entitlements in a given year. These vary depending on the volumes of water in storage and expected inflows. While trade in the MDB’s two key water markets—for water access entitlements and water allocations—is mostly undertaken by irrigators, trades also include purchases and sales by the federal and state governments (principally for environmental purposes), by environmental non-governmental organisations (NGOs) and also by investors (Grafton and Williams 2018).

## Understanding success

The MDB water markets are widely considered to be highly developed and well managed relative to other places in the world, including the United States (Grafton et al. 2011; Wheeler et al. 2014). In the southern MDB, water markets are accepted and trusted by water users and actively used by irrigators. They have contributed positively to both economic and environmental outcomes (Box 7.1). After a generation of water market development, most of the key technical design issues have been overcome and unforeseen technical and implementation issues addressed. Further, many of the state-based roadblocks and prohibitions on trade have been removed. Along with these developments has been a gradual accumulation of expertise by water users and significant improvements in water information availability and registry functions. But there was nothing straightforward or predestined about the generation-long policy development and implementation process that led to the water markets today.

### Box 7.1 Impacts of water markets in the MDB

- The value of sales and the number of transactions in the water entitlement market and the water allocation market indicate strong user support and a mechanism to manage the extreme variability of streamflow within the MDB with both opportunistic cropping and perennial agriculture industries.
- The market facilitates the management of enterprise risk by increasing the flexibility of use of a key input as a result of:
  - Water users be able to determine the holding of a water asset on the balance sheet and water allocation use on the profit and loss account.
  - Water use and market participation can be adjusted to reflect water scarcity, mitigating the impact of drought on farm output.
- The market increases regional gross product by moving water to higher-value uses.
- It allows new entrants (for example, the almond industry) in new or established districts to satisfy their emerging water needs.
- Competitive and widely observed market prices support business planning and understanding of the marginal value of water in direct use.
- It allows government and private environmental waterholders to utilise environmental water on the same basis as other water users.
- It increases the transparency of how and where water is used.

Sources: Grafton and Horne (2014); Grafton et al. (2016); Horne (2017b).

In the early 1990s, trade in water in the MDB was limited, largely comprising intradistrict trade of allocated water. Interstate trade was non-existent. In 1994, against a background of national concern about how water was being used in rural Australia, including its environmental cost, a major reform program was embarked on under the auspices of the Council of Australian Governments (COAG). It was both ambitious and uncertain (COAG 1994) and progressed quickly into the work of the Murray–Darling Basin Ministerial Council (MDBMC) and the Murray–Darling Basin Commission (MDBC).

At this time, the states jealously guarded access to ‘their’ water. Indeed, while agreements on how to divide the resources of the Murray River existed and had been amended—and amended again in minor ways since Federation (Guest 2017)—they had, in essence, remained the same. Essentially, the upstream states—Queensland, New South Wales and Victoria—wished to ensure as many extractions as possible for the economic benefit of their irrigators. Despite support for cooperative actions from South Australia (Klunder 1993), there was considerable wariness among the upstream states about capping use because it would be perceived as constraining growth in irrigated agricultural production.

The two national water reform blueprints since 1994—the National Water Initiative (NWI) in 2004 and the *Water Act 2007* (Cwlth)—both emphasised a similar key role for water markets in addressing scarcity and efficiency, while recognising the needs of the environment and third parties. While agreement in principle for the development of water markets occurred in the 1990s, politics and state rivalries largely hampered its implementation. Indeed, it was the impact of the ‘Millennium Drought’, which affected most of the MDB during the decade to 2009, that ultimately catalysed water reform and water market development. Water markets were identified as a key means to redistribute water in a way that helped both buyers and sellers. Thus, in 2004, when the NWI was agreed to by the relevant governments and, in 2007, at the height of the drought, key decision-makers were much more supportive of removing barriers to water trading than they had been in 1994.

While the contemporary southern MDB water markets are now very large and comprehensive (Figure 7.1), the growth of the market has been a painstaking and precarious process. Trading in both water access entitlements and water allocations has grown significantly over the past two decades.

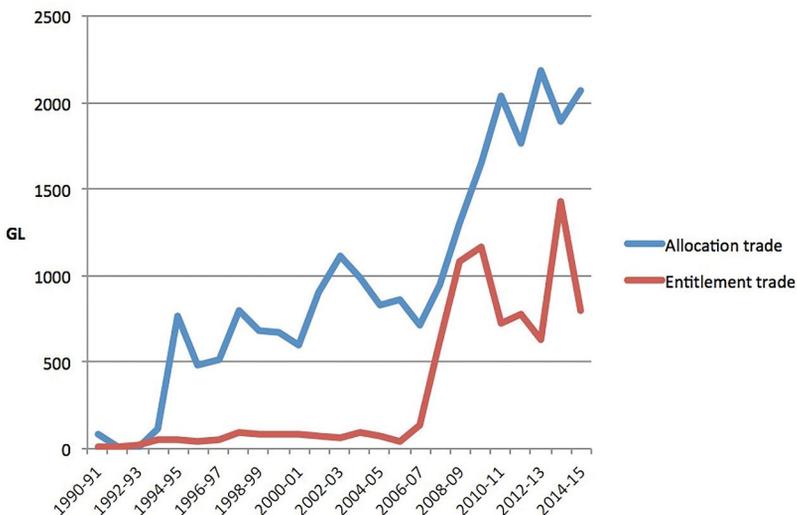


Figure 7.1 Southern MDB water allocation and entitlement trade

Source: ABARES (2016).

This market transformation has provided new agricultural opportunities and assisted with much needed structural adjustment, as the fortunes of specific agricultural products and the competitiveness of individual irrigation districts waxed and waned. The water markets have also been used by the federal and state governments to help achieve environmental objectives through their purchase and the use of water access entitlements for environmental and cultural purposes. Most economic models examining the likely impacts of expanding water markets and water trading in the MDB have also concluded that markets support an increase in the value of production and regional GDP, a reduction in vulnerability to drought and a reduced impact on regional communities from increased water scarcity (Kirby et al. 2014; Wheeler 2014).

A small number of observers blame water markets for causing poor business prospects and the ongoing depopulation of parts of rural and regional Australia (NSW Department of Trade and Investment, Regional Infrastructure and Services 2015; Peel et al. 2016), but the economic arguments proffered are far from persuasive. A more important critique has been of the provision of water entitlements almost entirely to irrigators who had preexisting water licences, but virtually no allocation to the First Peoples of Australia (Marshall 2017). A reallocation to First Peoples, as has occurred with water for the environment (Grafton and Wheeler 2018), is compatible with water markets should it occur through a voluntary buyback of water entitlements.

## Contexts, challenges, agents

While water use has been the subject of intense political discussion since Federation (Guest 2017), this case study mirrors much of what has occurred in many other areas of the Australian economy and society over the past 25 years—namely, the increasing influence of the national government and markets in resource allocation. In particular, in the decade from the early 1990s there was a focus on reforming the infrastructure backbone of the Australian economy. This process included the road transport, electricity, gas and water sectors (NCC 1998, 1999).

In the MDB, water reform has involved reexamining and revising the water allocation process in each state. Not surprisingly, this was a complex and lengthy process and reflected the changing economy and society in rural and regional Australia, where markets in many areas of economic

activity came to play an increasingly prominent role in daily life. The reform process responded, at least initially, to a collective national and state government judgement that broad-based water reform, including reforming the mechanism of water allocation, was required to support efficiency and to promote sustainable use across the nation.

The water reform component of the National Competition Policy (NCP) was called the 1994 National Framework for Water Reform (COAG 1994). Institutions and implementation processes were needed to undertake this unchartered task. The national and state governments, through the newly formed COAG, agreed to a reform process. Oversight of the implementation of the water reforms—originally conceived as a 10-year program—was entrusted to the independent National Competition Council (NCC), which was established as an advisory body to COAG. Most of the actions required state-by-state implementation, with the NCC playing an auditing role and national competition payments from the federal government to state governments providing a financial incentive for state actions (NCC 1999). This COAG framework identified the outcomes sought in each state's water management architecture and in cross-border arrangements relating to interstate trading of water within the MDB in particular. The reform program included the need for a comprehensive and clearly specified system of water entitlements, separation of property rights for land and water and trading of water and water entitlements (COAG 1994; NCC 1999).

The existing water policy framework—at that time largely determined and administered at a state level—was completely outdated. Water provision to both urban and rural users was heavily subsidised and water was not priced to reflect its scarcity value. There were also few opportunities to move water entitlements and their attached water allocations to service emerging high-value opportunities, as most water entitlements were still attached to land. Although most state governments had by this time halted issuing new entitlements, many entitlements already issued were not being fully utilised, leaving open the prospect of a future increase in water use.

A cap on water extractions was a necessary element to establish a market price for water and give greater visibility to scarcity issues. In 1994, there was no cap within the MDB as a whole or in specific valleys. Public servants administering water policy in individual states within the MDB were also ambivalent about water trading. It was said to be 'administratively difficult'

to execute trades outside irrigation districts and virtually impossible to sell entitlements. Further, in the early 1990s, state-owned water infrastructure operators dominated licences and water rights were still, by and large, attached to land. Many local governments were also ambivalent about reform and shared a common concern that water trading might encourage the movement of water out of their region. Neither Indigenous water rights nor the environment as a water user were part of the public or high-level discourses on policy reforms (COAG 1993; COAG Working Group on Water Resource Policy 1994).

## The policy process

### Establishing allocation trading: A first step towards modern water markets

The initial reform period consisted of tweaking the existing administrative framework rather than contemplating a new water allocation framework or giving water users more control over their water assets. In 1994, the MDBMC and MDBC began discussing the substance of a new irrigation management strategy, the need for an annual cap on water extraction within the MDB and water market instruments to facilitate interstate trade (MDBC 1994, 1995b; MDBMC 1994). The work required to facilitate interstate trade was both basic and fundamental:

- defining water use, to assist in defining a cap on diversions
- identifying options to enable trade in water allocations
- defining what was to be traded
- defining where trade could occur (southern MDB and border rivers between New South Wales and Queensland)
- accounting for salinity and drainage credits
- developing institutional arrangements for trade and the changes required to the MDB agreement, which governed cooperative action between jurisdictions
- developing arrangements for trading within unregulated river systems (by June 1996)
- developing arrangements to facilitate water entitlement trade (known at the time as permanent water transfers), by June 1997 (MDBC 1995b).

A 1995 MDBC audit of water use in the MDB was undertaken as part of deliberations to set a cap on diversions (MDBC 1995a). It examined lowering annual allocations, restrictions on constructing off-river storages, reductions in entitlements by administrative decision or buyback, better monitoring, reporting and compliance and interstate trading arrangements. It did not propose a cap and gave little weight to the role of water markets or water trading, but it did suggest interstate trading was one approach that might help tackle the problem of the growing impact of diversions on the environment.

Trading in water allocations had been occurring intermittently within irrigation districts and within states for some years, but volumes were very small (NWC 2011). Limited interstate trading of water allocations was agreed for the 1995–96 water year, with rules for trading refined as experience deepened (MDBMC 1996). Volumes grew substantially over ensuing years, boosted by the onset of the Millennium Drought in the late 1990s. Trade in water allocations was a natural starting place for interstate trade, as it did not challenge the basic assumption that each state was in control of a defined parcel of statutory water rights. Moreover, it allowed unused water in particular years to be moved around (traded) and used interstate but did not change the ownership of the entitlement or right itself or where it was located.

## Trading of entitlements: Challenging the basis of water allocation

An important first step towards the trading of water entitlements was to agree to a pilot project in the Mallee region in the southern MDB, which incorporated areas of three states (MDBMC 1996). A new schedule to the MDB agreement was needed and a plethora of technical matters had to be settled (MDBC 1997). In 1998, the MDBMC approved the pilot following much ‘toing and froing’, with extensive debate in project committees and the MDBC itself. The first trade under the pilot arrangements occurred in September 1998. During the next two water years, a minuscule quantity of water entitlements was traded, mainly comprising unused entitlements, which were sold for use in the viticulture, nut and citrus industries (MDBC 2000).

Notwithstanding the small volumes of trade and the restricted trade area, the pilot scheme provided a base from which to respond to various technical challenges with trade. This was very much a learning-by-doing process. A broad-based workshop involving the national and state governments, the irrigation sector, academics, water brokers and the MDBC, which examined the first two years of operation, concluded that ‘permanent interstate water trade should ultimately be expanded beyond the Mallee region’ (Tim Cummins & Associates 2000: 3). Potential barriers to market growth were also identified. Administrative systems governing interstate trade were characterised as fragile, with differences between states in the language used for identical assets proving problematic (Tim Cummins & Associates 2000).

Establishing interstate trading of water entitlements required states to improve their security and the processes needed to ensure trading could be completed efficiently and expeditiously. Many of these issues were raised in intergovernmental discussions and were the subject of discussion by academics and lobbying by peak interest groups. While the security around water entitlements gradually improved through legislative reform in each state, including water rights gradually being separated from land—although not until 2007 and 2008 in parts of Victoria (SRO 2017)—one of the most significant barriers to change came from within the irrigation sector itself. Key irrigation infrastructure operators (IIOs)—including Murray Irrigation Limited, Murrumbidgee Irrigation and Goulburn Murray Water—were concerned about the adverse impact of trading entitlements out of their district and the prospect of stranded assets (Hassall & Associates 2002). Transaction costs imposed by these entities by way of access, exit and termination fees had the potential to stifle trade, even if individual water owners within a district wished to trade with water users outside the district.

It was not until May 2003 that the MDBMC directed the MDBC to pursue opportunities to establish permanent interstate trade across the southern MDB (DAFF 2003; Interstate Water Trade Project Board 2004), although the press release from the chair of the ministerial council, the federal Minister for Agriculture, Fisheries and Forestry, did not mention the water trading outcome. What ensued were consultants’ reports and dozens of meetings by numerous MDBC committees. The views of the Australian Competition and Consumer Commission (ACCC 2006) were commissioned in relation to access, exit and termination fees. The very limited progress was evidenced by the slow growth of trading

in water entitlements and the very tentative political attempts to address increasing environmental degradation (Horne 2017b). While South Australia, Victoria and New South Wales had agreed to permanent interstate entitlement trading throughout the southern connected part of the MDB in late 2006, it was not until 2007 in the depths of the Millennium Drought that the MDBC consented to the key protocol that supported the reform of these fees and a lowering of transaction costs to trade (MDBC 2007).

The passage of time that ultimately resulted in interstate trading of water entitlements was an important part of the reform process. For example, revised state water legislation under the 1994 framework—for example, the *Water Act 2000* in New South Wales (WaterNSW 2018)—took considerable time to be implemented. The outcome was achieved in the context of national reform processes, with pressure kept on state bureaucracies through the NCP payment processes that provided financial incentives for states to achieve defined outcomes.

### Increased national involvement in water markets

While the decision by COAG in June 2004 to support the NWI intergovernmental agreement was widely applauded, implementing the reform elements proved difficult. Indeed, in June 2005 and again in July 2006, governments felt the need in COAG meeting communiqués to reiterate their commitment to the NWI and to progressing unfinished elements of the water markets agenda. These unfinished elements included conversion of existing water rights into secure and tradable water access entitlements and establishing open and low-cost water trading arrangements. Notwithstanding the renewed commitment, the agreed timetable slipped (COAG 2005, 2006).

Partly as a response to these delays and increasing concerns about water scarcity in the MDB due to the Millennium Drought, in September 2006, prime minister Howard announced the formation of the Office of Water Resources in his own department, with a key focus on water trading (Howard 2006). This led to the new National Plan for Water Security, signalling a step up in national involvement in water issues, and the passage in late 2007 of the *Water Act 2007* (Cwlth).

The broader water reform elements of this story can be found elsewhere (Horne 2013, 2016, 2017b). They included greater national responsibility for overall water resource management in the MDB, including new institutional arrangements (including replacing the MDBC with the Murray–Darling Basin Authority, a national government body), introducing a role for the ACCC in water market operations within the MDB, a more prominent role in environmental water management with the establishment of the independent Commonwealth Environmental Water Holder and the provision of \$3 billion to purchase water entitlements for environmental purposes. Further, specific Commonwealth Government programs focused on the future prospects of the irrigation sector and irrigation district efficiency and the provision of enhanced water information.

Some states were strongly opposed to increased national action on water reform more generally but, for the water markets, even after the change in national government in December 2007, attention turned to implementation. In particular, the ACCC's competition policy water agenda focused on strengthening the rights of irrigators to buy and sell their water assets more readily. At the time, irrigation districts were still imposing restraints on water trading (Commonwealth of Australia 2007; ACCC 2010, 2017). The development, and later introduction, of improved basin-wide water trading rules was also designed to improve the ease of trading and reduce risks. The new role for the Bureau of Meteorology (BOM) in water information—designed to increase the quality and availability of market information—would increase market transparency and reduce risk. State governments introduced new rules around the carryover of allocated water, improving the incentives to manage available water between water years.

By 2018, the southern MDB water markets had reached a level of maturity in terms of the annual volume of sales, but the water trading function (akin to the stock exchange function in shares) and water registries (akin to the land titles office for land) still have considerable room for improvement. The two traditional markets for water entitlements and water allocation continued to expand and dominate trading activity, but other fledgling markets (for example, trade in water delivery rights, forward allocation markets, water entitlement leases and carryover capacity) are expanding (ACCC 2017; ABARES 2018). Markets in the northern MDB are less developed and the attitudes of irrigators and administrators towards water as an asset (the water entitlement) remain immature.

A *Four Corners* investigation revealed systemic issues around water theft that were undermining confidence in the northern MDB (Horne 2017a). Anticorruption authorities are still investigating these matters, but they illustrate powerfully how well-functioning markets need strong, effective and ongoing regulatory governance. The exposure of possible corruption and water theft and a lack of adequate governance in New South Wales (Matthews 2017) also shows that states still have—through both action and inaction—the ability to derail water market reforms.

## Slow and steady wins the race

Water market development in the MDB can be characterised as a ‘success’ from the vantage point of 2018, but certainly not an ‘overnight’ success. Within the southern MDB, the benefits of water trading envisaged over two decades ago have been substantially achieved but, as with most elements of policy, expectations change and the goal posts move.

Table 7.1 summarises key changes in the status of water markets, key policy actions, the changing roles at different levels of government and, in a general sense, the major benefits and costs directly associated with water markets. Taken as a whole, we view the development of the water markets over the period under discussion as transformational, and in large part extremely successful in terms of outcomes and the likelihood of enduring support. What we have outlined is, in essence, how the water allocation process in the MDB has been changed to better manage the risks around scarcity; this is the core achievement. As international experience profoundly illustrates, instances of successful reconfiguration of water allocation processes have been few and far between.

Table 7.1 Water markets in the MDB: Transformative, incremental development

| Issue  | 1970–94  | 1995–2006   | 2007–18  |
|--|--|---|--|
| <p><b>Status of water markets</b></p>            | <p>No water markets in contemporary sense<br/>Small volume of informal intradistrict water trading</p>           | <p>Key foundation stones for intrastate and interstate water markets gradually established, including a cap on diversions in the southern MDB<br/>Allocation market gradually expands and pilot interstate trading entitlement trading commences<br/>Only lip-service paid to the environment</p>   | <p>Water entitlement and water allocation markets mature and grow as restrictions are eliminated and transparency improves<br/>Enforcement of SDLs on surface and groundwater resources to be enforced from July 2019<br/>New market for water delivery rights<br/>Ongoing acrimonious debate about the acceptability of water shares between agricultural and environmental interests</p>   |
| <p><b>Key policy actions (what happened)</b></p> | <p>Widening role of joint MDB-wide science activities to assess and address declining environmental outcomes</p> | <p>Attributes required for water markets agreed, including:</p> <ul style="list-style-type: none"> <li>• Comprehensive system of water entitlements, including clear specification of rights</li> <li>• Separation of property rights for land and water</li> <li>• Trading rules for allocation of water and water entitlements</li> <li>• Introduction of consistent water sharing plans</li> </ul> <p>Cap on surface water extractions reflecting existing level of development agreed and implemented<br/>Stronger scientific role in understanding the impact of irrigation on the environment<br/>Pilot design architecture developed for interstate trading and significant expansion of allocation trading<br/>State water legislation modernised, strengthening water entitlements</p> | <p>Competition policy outcomes strengthened with new role for ACCC (e.g. through IIO charging and transformation) and MDB plan water trading rules<br/>New BOM function improves water information and availability<br/>Basin-wide water trading rules introduced<br/>New state policies on storage and carryover encourage more efficient water use<br/>Victoria's infamous 4 per cent rule restricting trade out of some districts eliminated<br/>New SDLs on surface and groundwater<br/>State registry processing times reduced<br/>Private digital trading platforms improve transparency</p> |

| Issue  | 1970–94  | 1995–2006   | 2007–18   |
|--|--|---|---|
| <p><b>Roles of levels of government (a key element in how it happened)</b></p> | <p>Detailed state water policies and administration almost entirely within the domain of state governments</p> <p>National government involved in brokering overall agreements on the Murray River and on the formation of basin-wide institutions, the MDBMC and the MDBC</p> | <p>States remain firmly in control of water policy, particularly early in period</p> <p>Stronger national framework role:</p> <ul style="list-style-type: none"> <li>• 1994 National Framework for Water Reform agreed as part of national microeconomic reforms under the aegis of COAG, with strong flow through to MDB water market development</li> <li>• Independent NCP reviews backed by NCP payments to the states provide an incentive for state action</li> <li>• 2004 NWI and establishment of the National Water Commission strengthen national oversight of water markets</li> </ul> | <p>National oversight of MDB water markets increases significantly through new ACCC, BOM and Murray–Darling Basin Authority roles outlined in Water Act 2007 (Cwiffh)</p> <p>New Commonwealth body, the Murray–Darling Basin Authority (MDBA), replaces MDBC, with basin-wide trading rules</p> <p>New Commonwealth Environmental Water Holder introduces basin-wide approach to use of environmental water, backed up by large water portfolio</p> <p>Key state roles of implementation and enforcement</p> <p>Shadow cast over NSW commitment to water market principles in northern MDB</p> <p>State restrictions inhibit Victorian rural–urban trade</p> <p>Increased role for community engagement</p> |
| <p><b>Benefits and costs</b></p>   | <p>Little downside, but also very limited benefits</p>   | <p>Significant benefits to many participants in annual allocation trading</p> <p>Restrictions on trading limit benefits and increase interyear and intrayear uncertainties</p> <p>Lack of carryover policies undermines potential benefits of trading</p>   | <p>Water migrates to higher-value uses and to areas suited to strongly performing commodities</p> <p>Water use managed between years, depending on business and environmental needs</p> <p>Agricultural producers and environmental waterholders able to manage business more flexibly</p> <p>Trading allows businesses adversely affected by climate change and/or shifts in commodity markets to sell off valuable assets</p> <p>Trading allows environmental water allocations to be moved to service the environmental assets in greatest need</p>  |

Explaining ‘how’ policy success was achieved, particularly success after 25 years, is fraught. Our thesis that it was achieved incrementally is hard to dispute, but it is much more difficult to pinpoint precisely why barriers were breached at any particular time.

Moreover, there was nothing inevitable about this progress. Persistence, resilience and alignment of some key factors resulted in gradual forward movement. What is clear from reviewing detailed historical documentation and from participation in those processes for over a decade is that each country, and indeed perhaps each river basin, will need to tackle its own specific circumstances (Grafton et al. 2017). At the process and political levels, the evolution of water market development has been very messy. Sometimes the political process has been pivotal to progress, while at other times it has hampered it.

## Implementation time frames

The MDB water markets took an unexpectedly long period to develop and mature.

With the benefit of hindsight, the lengthy implementation phase is not so surprising. The world of rural water administration in the early 1990s was dominated by engineers and hydrologists and focused on states determining how water should be used and in what quantities on different types of land. Many agricultural commodities were centrally marketed. At that time, markets more generally, and what they represented, played only a limited role in the life of water users and water administrators.

Reconfiguring water resource management to respond to the needs of scarcity in a rules-based society requires concerted multidisciplinary actions that take time to develop (Grafton et al. 2016). The technical details of ‘how to’ had not been developed and individual governments proffered competing positions. Once administrators understood and agreed on how to move forward, political support was necessary to see this incorporated into the law of individual states or the national government. In the early 1990s, water was not perceived as a private good and, with use linked to land in the case of irrigation, it was not treated as a transferable asset as it is today. Further, the power of IIOs and bulk water providers tended to subjugate the interests of individual users. Upgrading the quality of the water property right was a central issue in developing confidence in the MDB water markets. It was the central issue in reshaping the water allocation system that had operated before the advent of extreme scarcity.

## Role of leadership

There is a question of whether water market reform would have been made without concerted intervention from ‘outside’ forces promoting change. These were the central agencies at the state and federal levels—the departments of the prime minister and premiers and the state and federal treasuries—which were the champions of microeconomic reform more broadly and water market reform specifically. This also included the newly formed NCC, which oversaw financial incentives to state governments that met their commitments to put in place functioning markets. These were important forces, shepherding actions through the early stages of reform. These reform champions were aided by a period of severe drought (the Millennium Drought) and, later, by a national government prepared to step outside what had been seen as its traditional sphere of influence (Briese et al. 2009).

Whereas actions by state and federal water ministers often slowed market growth—sometimes aided and abetted by the unanimity decision-making rule of the MDBC—individuals did matter. The 2007 national intervention provided a major fillip to strengthening MDB water markets and the overall water reform process. It was a determined effort to break through logjams from existing institutional arrangements. Prime minister Howard and his water minister, Malcolm Turnbull, were prepared to act and take responsibility for difficult rural water issues thrown up by the Millennium Drought and address ongoing problems from existing institutional arrangements. This determination from the prime minister, backed up by financial resources, supercharged the reform process. Perceived constitutional issues were scrutinised but found not to be a hindrance to effective action (Briese et al. 2009).

While aspects of the reform have been heavily criticised (e.g. Grafton and Williams 2018), its focus on water markets is widely viewed as a success. For the MDB, the *Water Act 2007* (Cwlth) strengthened the water market framework sufficiently to underpin significant growth in transactions and in interstate trade and to facilitate greater resilience in the economy (Kirby et al. 2014).

## Politics as a hindrance

Eventual ‘success’ in the MDB came notwithstanding the complex, lengthy and often acrimonious negotiations involving several levels of government and multiple interested parties from 2007 onwards. While the NSW premier’s initial response was strongly supportive of the Commonwealth’s proposals, the Victorian premier was antagonistic from the outset, arguing that he would cooperate providing certain conditions were met, but promptly proposing conditions he knew would be politically unacceptable to others. From a Commonwealth perspective, it appeared that protecting state interests compromised economic, social and environmental outcomes for the basin as a whole. One explanation of the acrimony is that the national government was proposing to become much more actively engaged in MDB water affairs in much the same way as it had in many other policy areas (for example, the closure of state-based stock exchanges and the national regulatory role in corporate affairs and electricity markets). This was regarded as a threat to established ways of doing business, rather than a positive step towards a more modern and efficient business model.

A microcosm of the post-2007 water policy implementation process was the attempt to upgrade state water registers to reduce transaction costs around interstate trade. The project sought to standardise water registers in New South Wales, Western Australia, South Australia, Tasmania, the Northern Territory and the Australian Capital Territory, and put in place a new register system, personal water accounting and tracking of water entitlement trade applications. The existing Victorian and Queensland water registers were not included in this project, but the aim was that all state registers would ‘work together so that data can be transferred automatically between each register’, facilitating efficient interstate trade, particularly in the MDB (Commonwealth of Australia 2007). Despite significant investment, the national government finally halted attempts to complete the national water market system and it remains a gap in MDB water market development today. Making information freely available at the basin-wide level would have required state actors to become more transparent in their actions.

At another level, community politics and buy-in are important factors in achieving success and resilience of policy actions. In the case of the water markets, strong support came from users—evidenced by their participation in market trading. It has grown slowly and organically,

as users individually came to understand the benefits that can flow from them. This provides a contrast to the basin plan. The MDBA conducted 24 town hall meetings, 56 roundtable meetings with community leaders and key groups and 30 meetings with Indigenous communities. Nearly 12,000 submissions were received from the community, which led to 300 changes to the draft basin plan (Horne and Guest 2014). Yet there was still a level of discontent, with social media now an important channel to convey (mis)information.

## Role of crises

At each of the key policy junctures (in 1994, 2004 and 2007), there were crises of sorts. In the early 1990s, broad-based microeconomic reform was needed and there was a clear consensus within central agencies and among heads of governments that many areas of the economy needed reforming. Water was one such area and markets were seen as potentially playing an important role. This was a challenge to agencies that traditionally handled water matters, as the operation of markets was outside their normal bounds of doing business. Heads of government directed action be taken, and within the MDB, responsible ministers were similarly directed. By the early 2000s, much had been achieved in water reform generally and within the MDB specifically, but with the Millennium Drought in progress, central agencies and heads of governments were again unhappy with progress, leading to a further intergovernmental process (the 2004 NWI) to renew pressure on reform. The year 2007 was materially different in that the central government agencies responded to the deepening drought in the MDB.

The adage of never wasting a crisis is apposite, but to do so it is critical to prepare well in advance. Prime minister Howard's 2007 Australia Day speech was not prepared 'on the back of an envelope', as one state water minister colourfully suggested, but came from months of detailed dialogue and critical analysis. The key point is that the shortcomings of a system are often well known among the active players; often, a real difficulty is finding leaders to address these shortcomings and the circumstances in which they can be resolved or mitigated.

There often are sharp differences in views about what can be done, particularly when incumbent interests are being challenged, and a real problem of 'industry capture' of public servants whereby the interests of key stakeholders, such as irrigators, are identified as the state or national

interest. In part, this reflects elements of Australia's political system that seek to protect specific state interests, on the one hand, and sectoral interests (for example, prioritising rural over urban interests) on the other, with little regard to broader national or, in this case, basin-wide interests. One iconic example of this was the infamous 4 per cent trade-out rule restricting the sale of water entitlements in Victoria (ACCC 2009) outside irrigation districts, which was finally revoked in 2014.

## Effective regulation critical to markets

The strength of the southern MDB water markets is their highly regulated structure and well-accepted fairness, buttressed by hydrology, even if there are minor ongoing concerns that IIOs might impose trade restrictions or levy fees that inhibit trading out of irrigation districts (ACCC 2017). The same is not true for the northern MDB, where the water markets are small in terms of the volume traded and the proportion of water available to trade. Thus, there still appears to be a much more cavalier attitude to water use by users and water theft appears to still be prevalent, even among some of the larger users.

Compliance in the NSW part of the northern MDB has been left to that state, which appears to have a major cultural problem in its public service towards compliance and enforcement of water plans and water licences, even in the otherwise generally well-managed MDB water markets (Horne 2017a; Matthews 2017; MDBA 2017). The difference illustrates how the overarching regulator of the MDB water markets, the MDBA, needs to play a more hands-on role. For example, it needs to ensure there is strong compliance of state water trading rules with the basin plan's trading rules, which became operational in 2014. Yet, as of 2018, no public audit had been undertaken of these rules.

## Conclusions

The water story in the MDB shows that the path of developing the basin's water markets was neither linear nor optimal, but rather one of grasping opportunity at times of crisis, building coalitions of interests and actions by policy champions who were able to provide the intellectual framework and motivation for what has become transformational change. Success came after a long struggle, reflecting both policy initiatives and increased activity by water users. Effective and longstanding policy reform requires

vision, diligence, persistence, vigilance and, sometimes, even luck. None of these should be taken for granted. Opportunities to strengthen the policy framework should be taken when they arise.

The lengthy time frames in water market development demonstrate not only the complexity of policy, but also the transitions in culture in the rural water sector, in public sector administration and among IIOs (both privatised and corporatised state-run organisations). The policy process that transformed the water markets is one in which many water users have been frustrated at the slow pace of change. It is also the case that, as participants in the market came to understand and trust its benefits, they warmed to the idea, underpinning its strong organic growth even as the Millennium Drought receded.

The process of water market development is ongoing, notwithstanding the transformation that has already occurred. There are, for example, opportunities to reduce transaction costs further by digitising the whole-of-market processes and providing greater transparency and real-time access to information for all market participants. Much greater attention must also be given to metering and compliance and also to inequities of water allocation to the First Peoples of Australia. Further, to ensure the long-term success of water markets, the central basin-wide regulatory authority, the MDBA, must account for the effects of water trade on return flows. These cultural and environmental considerations need to be part of the water markets story going forward.

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