Chapter 20
Unbundling Water Rights as a Means to Improve Water Markets in Australia's Southern Connected Murray-Darling Basin

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Abstract Australia has defined its water entitlement and allocation arrangements in a manner that has made it possible to establish one of the world's most sophisticated water marketing systems. Entitlements are defined in perpetuity as an entitlement to a proportion of any allocations assigned to a water resource pool. Entitlements and allocations are tradable and in the Southern Connected River Murray system a vibrant water market has emerged. The functioning of this market is reviewed in this chapter. Overall the assessment from an individual water use perspective is that the introduction of this EPI has succeeded. From a national perspective, most experts also describe it as a success. As a Nation however, Australia would have been better off if it had solved the water accounting and over-allocation problems before it introduced water trading. An important conclusion is that unbundling has made it easier to resolve issues step by step. It also makes it much easier for individuals to adjust and innovate. New business and new technology must be expected to emerge with each reform that is made. The chapter concludes by highlighting relevant policy lessons for the practical application of water markets.

Keywords Water markets • Unbundling water rights • Australia • Water entitlement and allocation arrangements

20.1 Introduction

Australia has defined its water entitlement and allocation arrangements in a manner that has made it possible to establish one of the world's most sophisticated water marketing systems. This system is best developed in the Southern Connected Murray-Darling System which sits within Australia's Murray-Darling Basin (Fig. 20.1).

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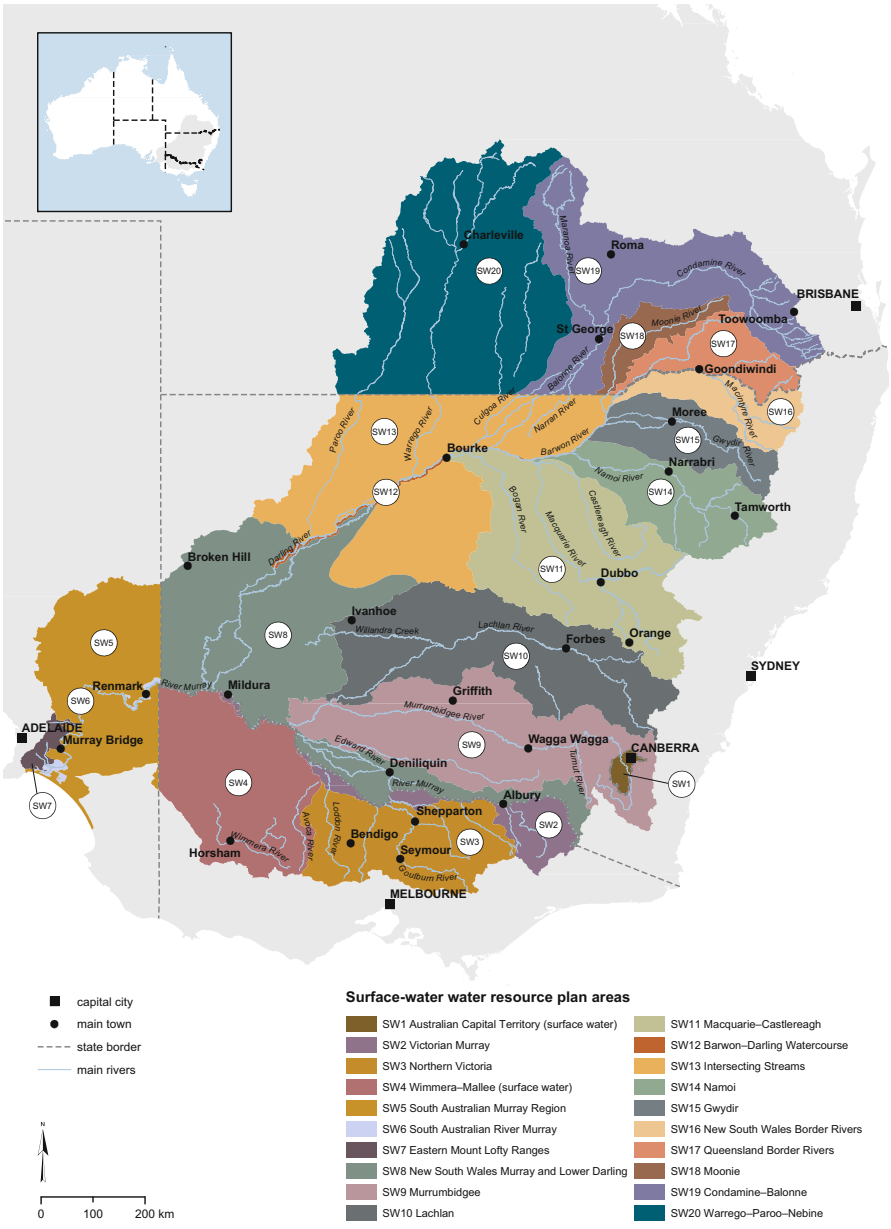

Fig. 20.1 The Murray-Darling Basin. The southern connected portion of this Basin, where water markets are most developed, includes the Murray, Lower Darling, Murray Murrumbidgee, Ovens, Goulburn Broken, Campaspe and Loddon Catchments (MDBA Guide to the proposed Basin Plan, 2011)

Initially, irrigators were issued licences to irrigate a maximum area of land. These licences were converted into licences to take up to a defined maximum volume of water each year. As irrigation expanded, a way to ration water use became necessary. At the entitlement level, initially, two types of licence were introduced

- High security licences – which nearly always received their full allocation; and
- General security licences – which only received a full allocation in wet years.

When it is not possible to give users their full allocation, water is allocated first to High Security Licences and then to general security licence holders on a proportional basis. Eventually, it was realised that no more licences should be issued and a cap was placed on water use in an attempt to prevent over-use and maintain environmental assets. At the same time that this limit – known as the cap – was introduced a suite of water reforms were put in place to enable water trading. The initial objective of trading was to make water use more efficient and enable it to move to its highest and best use at any point in time.

Initially trading was administratively complex and slow. Gradually, however, experience increased and the benefits of trading became more and more apparent. There have been dramatic increases in water use efficiency and considerable innovation.

One of the key innovations that made it possible to trade large volumes of water efficiently is the introduction of what is now known as "unbundling". Unbundling involves the conversion of one property right into a bundle of separate instruments each designed to pursue a different objective and, often, operate at different scales. Today, two markets exist – one for water shares and one for allocations. All water use is metered.

20.2 Rationale for Choosing the Case Study

While it would be possible to present the "Australian" water entitlement, allocation, use control, distribution management and trading system as a case study, for the purposes of this chapter it is judged more useful to focus on one of the key features of this system. The feature chosen is the "unbundling" of the licensing system.

Unbundling is chosen because it demonstrates one of the necessary conditions for the development of market-based approaches to the management of natural resources that can be expected to remain efficient through time and deal equitably and fairly with large numbers of water users.

The underpinning goal of water trading was to increase economic growth by allowing water to be moved to places where it could make the greatest contribution to economic development. The initial argument was that water should be put to its "highest and best use."

In retrospect, however, Australia has learned that water trading enables efficient and rapid adjustment to extreme water scarcity. The "unbundling" innovation identified in this case study has been critical to the development of this capacity to adjust quickly to water scarcity problems.

Australia began with a water allocation system that issued a single property right (a licence) to a water use. Each licence consisted of a "bundle" of entitlements to use water, conditions about how it may be used, etc. Unbundling involves the separation of this bundle of rights into a number of separate parts.

Prior to the introduction of unbundling, the amount of water used by irrigators was administered using a licensing system that made it difficult to transfer water allocations from one location to another. Transaction costs were high and, typically, it took months to complete a trade. The approach taken was to temporarily transfer the licence from one water user to another, then take the water off the licence and then, after the water had been taken from the licence, the licence was transferred back to the original owner. The process was slow and administratively complex. To this day, this type of transfer is known as a temporary trade because the trade used to involve the temporary transfer of a licence from one person to another.

To simplify this process, a decision was taken in 1994 to allow people to hold water licences without owning any land. In order to facilitate this and increase investment security formal water entitlement registers were established and procedures put in place to enable landholders to obtain permission to irrigate an area of land without knowing where the water would come from. As reforms progressed further, it was decided to define water licences as shares and issue them in perpetuity.

Separate bank-like water accounts were then set up and structured so that water could be allocated to each shareholders account in proportion to the number of shares they held. In parallel with these arrangements, any landholder who wished to use some water in an account needed to have a use approval that authorised the government to deduct water from an account as it was used. Whilst complex, the result was the emergence of extremely efficient water trading arrangements.

In parallel with these reforms, efforts were made to improve system-wide planning processes so that irrigators could make investments with greater confidence.

20.3 Legislative Setting and Economic Background

In Australia, the degree of protection from competition in the production of agricultural products is low.

Significantly, in 1994 Australia established a National Competition Policy that sought to use markets as the prime mechanism to make water use and many other services provided by government more efficient. This commitment, nearly 20 years, has forced many changes. Productivity and water use efficiency are now much greater (Young 2008).

With regard to the legislative setting used to enable water management:

- Each component of the unbundled set of arrangements is defined in legislation and in a suite of plans approved by parliament.
- A key feature of the resultant suite of institutional arrangements is a process that uses the approved plans to manage third party impacts.

– If a third party is aggrieved by a water trade and the trade is in accordance with the rules set out in the plan, the only course of action available for a third part to prevent the trade from occurring is to arrange for the rules in the plan to be changed. There is no opportunity for a third party to prevent a transaction that is consistent with rules set out in the plan.
– An independent regulator is used to minimise opportunities for regions to find ways to impede trades from occurring. A complex set of rules, for example, are used to define the maximum fee that a person may be charged for trading water from one district and into another.
– As each stage in the development of the current unbundled system of property rights was introduced, a pragmatic decision was taken to begin by defining formally defining each dimension of the emerging system in a manner that mimics the status quo. (This is known as grandfathering.)

Figure 20.1 shows the location of the Murray-Darling Basin in Australia and its prime water resource management regions. Water trading arrangements are most developed in what is known as the Southern Connected River Murray System. This southern system contains a suite of large dams at the top of the system coupled with a series of locks and weirs that makes a high degree of flow regulation possible.

20.4 EPI Background

The Australian approach to the development of an unbundled water entitlement and allocation system has evolved over many years. Many mistakes have been made and many lessons learned. In a paper prepared for the OECD, Young (2010) identifies 17 lessons of particular importance to the development of systems like this.

In retrospect, a number of the key features of the Australian approach were developed without any expectation that an EPI would ultimately be established.

An historical decision to define all licences within a region in a similar way has made the development of low cost water trading arrangements possible. In effect, each water region is treated as a pool of water available for use. Within any defined pool, all licence holders are treated equally and, unlike the USA, no licence holder is more senior than any other licence holder. This also made it possible ultimately to define water entitlements as shares and make allocations in proportion to the number of shares held.

A decision in 1994 to commit Australia, through a National Competition Policy, to the development of more competitive approaches to the development of the economy by bringing market disciplines to the delivery of many services provided by state governments and "fine" states who did not implement the required policy reforms within an agreed timeframe. In water this required, among other things,

1. The separation of water licences from land titles so that it would be possible for people to hold a water licence even if they did not own any land.

2. The corporatisation of all water supply arrangements so that those responsible for water allocation and policy decisions would not be responsible for delivery of water. In practice, this meant that each state had to transfer ownership of its water supply and delivery infrastructure to a company and appoint a board to make all decisions associated with the operation of this infrastructure.
3. A requirement that each water supply business recover at least the full marginal costs of operating that business and move progressively towards full cost recovery including the cost of environmental externalities.
4. That it become possible to trade water from one location to another. In the same system and that it be possible any one to own a water entitlement – even if the y don't own land.

A parallel decision in the 1994/1995 to place a limit of the total amount of water that could be diverted from all surface water resources in the Murray-Darling Basin – known as the "cap" was also taken.

Federal and State agreement to implement a National Water Initiative in 2004 that added a lot of detail to the 1994 competition arrangements and, in particular, required:

(i) clear and nationally-compatible characteristics for secure *water access entitlements*;
(ii) transparent, statutory-based water planning;
(iii) statutory provision for *environmental and other public benefit outcomes*, and improved environmental management practices;
(iv) complete the return of all currently over-allocated or over-used systems to *environmentally-sustainable levels of extraction*;
(v) progressive removal of barriers to trade in water and meeting other requirements to facilitate the broadening and deepening of the water market, with an open trading market to be in place;
(vi) clarity around the assignment of risk arising from future changes in the availability of water for the *consumptive pool*;
(vii) water accounting which is able to meet the information needs of different water systems in respect to planning, monitoring, trading, environmental management and on-farm management;
(viii) policy settings which facilitate water use efficiency and innovation in urban and rural areas;
(ix) addressing future adjustment issues that may impact on water users and communities; and
(x) recognition of the connectivity between surface and groundwater resources and connected systems managed as a single resource.

A series of attempts to resolve over-allocation and water accounting problems in the Murray-Darling Basin first by a decision to secure 500 GL of water for the environment under a Living Murray Initiative and second by the transfer of Basin wide water planning responsibilities to an independent Murray-Darling Basin Authority and the commitment of A$3.1 billion for the purchase of water entitlements from

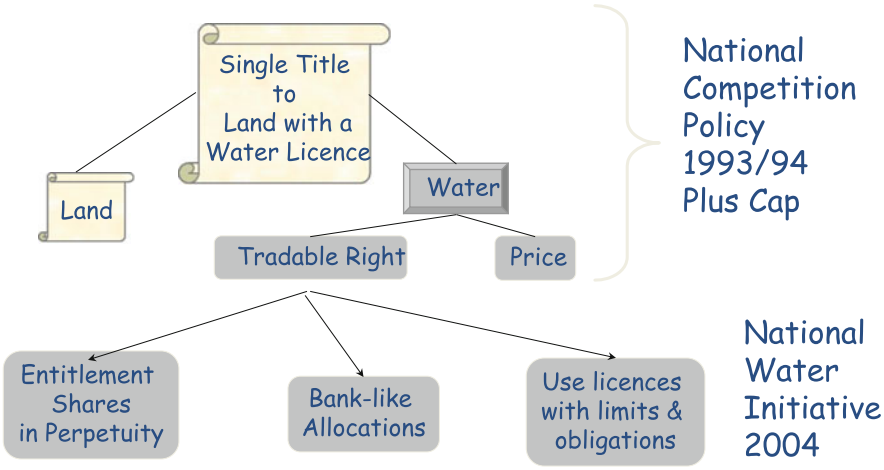

Fig. 20.2 An overview of the way that water licence arrangements in the Murray-Darling Basin have been unbundled (Own elaboration)

irrigators and the transfer of these entitlements to a Commonwealth Environmental Water Holder coupled with the commitment of A$5.8 billion for investment in so-called water savings projects to improve water use efficiency in a manner that enables half of the savings made to be transferred to the Commonwealth Environmental Water Holder.

Figure 20.2 provides an overview of the unbundling process. Prior to the introduction of unbundling, the amount of water used by irrigators was administered using licences that made it difficult to move water allocations for one location. The approach taken was to temporarily transfer the licence from one water user to another, then take the water off the licence and then, after this had been done, the licence was traded back again. The process was slow and administratively complex.

The formal proposition that it made sense to unbundle water licences was first made by Young and McColl (2002) and followed from Young's involvement in drafting amendments made to administrative arrangements in New South Wales in 2000. In particular, the legislation required licences to be defined as shares of water allocated in proportion to the number of shares held.

As shares had no water use conditions attached to them, they could be defined as rights in perpetuity. The definition of shares in perpetuity proved to be particularly important. It meant they could never be taken away. Under this new arrangement, the only way an aspiring water user could gain access to water was to convince an existing water user to sell water or sell a water access entitlement to them.

In the process of unbundling it became necessary to establish formal registers that define each licence holder's share of any water allocated to a region.

Separate bank-like water accounts were then set up to record the amount of water allocated to each shareholder and track use and sales of that water. Typically, allocation

announcements are made twice a month and, as soon as the announcement is made, these allocations are credited to each water account.

Conditions that regulate the use of water at any location are defined using a separate policy instrument with the result that entitlement and allocation trades can be executed without having to consider the nature of any externalities resulting from a decision to move water from one location to another.

Separate works approvals and delivery entitlements were also issued.

The result is an administrative framework where there are as many policy instruments as there are policy objectives. Much more efficient management becomes possible.

Whilst complex, the result was the emergence of extremely efficient water trading arrangements. Today water allocations trade over the Internet and water trading has become a business that involves many brokers.

Surprisingly, there was little consultation around the detail of the unbundling reforms and the legislation that surrounded it. In each case, the reforms were presented as a win-win opportunity for licence holders. From the outside, the reforms looked like an attempt to simplify administrative procedures and define licensing arrangements with rigour.

20.5 Environmental Outcomes

These apparent benefits of the unbundled approach to water allocation used in the Southern Connected River Murray System hide an important oversight. Unbundling drove structural adjustment, investment and innovation but unless the system-wide water allocation system is designed to adjust for these changes, the system must be expected to trade into trouble (Young 2014a).

In Australia's Murray-Darling Basin, this is exactly what happened. A massive over-allocation problem has emerged because system managers and the agreements they had negotiated did not anticipate the extent of change that the EPI would induce.

In retrospect it can be seen that it is critical to establish robust water accounting arrangements and allocation arrangements that are consistent with hydrological realities. When these arrangements are not in place the introduction of an EPI can make the nation as a whole, many communities and many individual irrigators worse off.

The unbundling of water entitlements in Australia made the low cost and rapid trading of water allocations possible. Today, most water allocation trades are executed in less than 2 days. Trade is possible across state jurisdictions and during the irrigation season occurs on a daily basis.

The sequence of reforms is important to understand (see Box 20.1). In the Murray-Darling Basin, these reforms began, in the late 1980s, with a series of negotiations that introduced a cap on diversions in 1994. This "cap", as it was called, was acknowledged as an interim cap and was expected to prevent an increase in

Box 20.1: An Overview of the Sequence of Water Reforms in the Murray-Darling Basin

1994: Introduction of an interim cap on diversions

1994: National Competition Policy requires states to introduce policies that require full cost pricing, the introduction of water trading in rural areas and arrangements that allow water entitlements to be held by legal entities that do not hold an interest in land

1996: Within-state trading allowed

1998: A 2 year pilot interstate water trading trial commenced between NSW, Vic and SA but limited to areas close to the South Australian border

2000: Review of interstate water trading results in a decision to expand trading to cover most surface water use in the connected Southern Connected River Murray System

2002: Various proposals for the reduction of water use in the Basin by reducing allocations by as much as 1,500 GL which eventually resulted in a decision to take a first step towards solving the "problem" by returning 500 GL to the environment over the next 5 years

2004: National Water Initiative introduced

2007/2008: Commonwealth Government passes a Water Act that attempts to transfer responsibility for development of a water use plan for the Murray-Darling Basin and the resolution of over-allocation problems in this system to the Commonwealth. Subsequent negotiations between the Commonwealth and State Governments eventually resulted in a decision to establish an independent, expertise based Murray-Darling Basin Authority coupled with arrangements that gave State Ministers and officials a larger say in the development of the Basin Plan

2010: A guide to the Basin Plan released

2011: A proposed Basin Plan released

2012–2013: Basin Plan finalised and approved by Commonwealth Parliament

Source: Own elaboration

water use. If the cap had been introduced without the introduction of trading the volume of water used in the basin would have remained the same.

In 1994, however, as part of a National Competition Policy, state governments were required to allow water entitlements to be held separately from land titles and traded. The result was a dramatic increase in the volume of trading (see Fig. 20.3).

Trading stimulated widespread investment in technologies designed to improve water use efficiency. These investments, however, significantly reduced return flows and, also, in the use of ground water that previously flowed unused into the river (Young and McColl 2003; Young 2010). There was also a significant increase in the capture of overland flows that previously flowed to the river. In short, the introduction of water trading worsened the extent of the Basin's over-allocation problem that

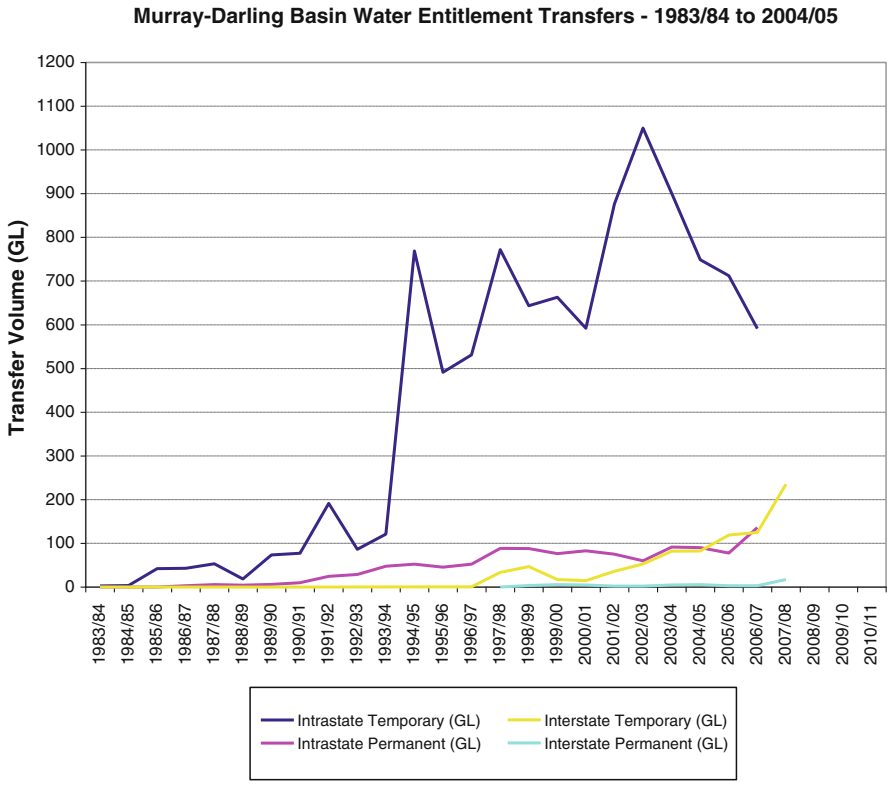

Fig. 20.3 Development of Murray-Darling Basin water market. Allocation trades are known as temporary trades. Entitlement trades are known as permanent trades (Young 2010)

was identified when the cap was introduced. In retrospect, the cap should have been a cap on *nett use* rather than a cap on diversions which allowed those who improved irrigation efficiency to expand water use (Young 2010).

In 5 years immediately after the introduction of water trading, use of water increased by 29 %. The area irrigated increased by 22 % (Bryan and Marvanek 2004) and nearly all of this new area involved the establishment of new vineyards and orchards. None of the water allocation plans, however, made any allowance for this increase in water use. Allocations continued as if no increase in water use had occurred. As a result, late in 2002 the River Murray stopped flowing and in November 2003 dredges had to be put into the mouth of the River to keep it open.

Officials were aware of these problems but were unable to find a politically acceptable way to manage the adverse effects of these processes on the health of the river. By 2002, it had been estimated that, at least, 1,500 GL of cap equivalent would be needed to restore health to the Basin and estimates of the economic and social impacts of securing this and other amounts of water for the environment where being made (See for example Young et al. 2002). Whilst the increasing environmental

costs of not fixing the Basin's over-allocation problems were appreciated, governments found difficulty in agreeing about what to do. Ultimately, it was decided that a Living Murray program would be implemented as a first step towards solving the over-allocation problem. Under this program, it was decided that 500 GL of water would be secured for the environment over the 4 years between 2004 and 2009. This amount was, however, insufficient to cover the losses being caused by the expansion of irrigation and investment in new technology (Young and McColl 2003).

Nett progress in the resolution of the over-allocation problem was negative and, in 2007, the Commonwealth Government decided to step in and introduced a new Commonwealth Water Act coupled with a commitment to purchase A$3.1 billion of water entitlements and invest a further A$5.8 billion in improving the efficiency of irrigation on the condition that half to the savings were returned to the river. Progress still proved difficult and in 2010 the Murray-Darling Basin Authority in a guide to the development of a new plan for the basin estimated that entitlements in the entire Basin had to be reduced by over 3,000 GL (MDBA 2010). Whilst the benefits of trading were apparent it was becoming increasingly clear that the costs of not fixing the Basin's over-allocation problems before introducing water trading were rising. A problem that could have been fixed in 1994 – at little cost to taxpayers – had evolved into a problem that would cost over A$8.9 billion of tax revenue to fix. In retrospect, Australia got the sequence of the reforms it implemented wrong (Young 2014b).

20.6 Economic Efficiency

As shown in Fig. 20.3, the decision, taken in 1995, to enable water entitlements to be held by people who did not own an irrigation property was critical in reducing the transaction costs associated with water trading. Once implemented, investors could decide when and how to buy water and many innovations followed. The old command and control approach where permission to change where water was used was difficult to obtain was abandoned.

To the surprise of many, but as expected by the architects of this reform program, the result was a large degree of innovation and new investment in water use. Water use efficiency has increased dramatically. As shown in Fig. 20.4, the return on investment in water entitlements has averaged well over 12 % per annum. During the long dry period in the MDB from 2002/2003 to 2008/2009 all assessments of Basin productivity have shown that trading was critically in minimising the economic impact of this period on the irrigation community (NWC 2010). The National Water Commission has estimated that the introduction of water trading has increased Australia's Gross Domestic Product in the 2008/2009 irrigation year by A$220 million.

Adoption rates for water trading are high. In the 3 years to 2010/2011, ABARES estimates that 43 % of irrigation farms in the Southern Connected River Murray

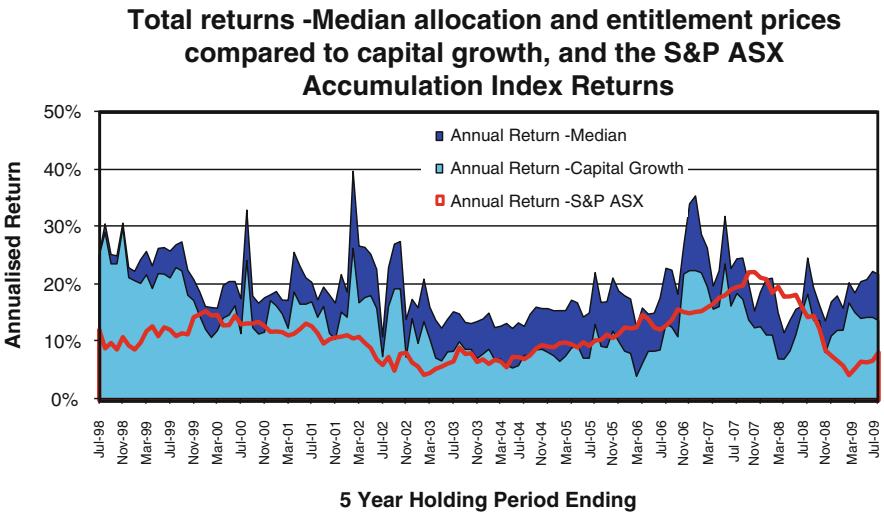

Fig. 20.4 Annual returns from selling allocations (*dark blue*) and capital growth (*light blue*) in the value of a water entitlement compared with an index of the value of shares in the Australian Stock Exchange (S&P ASX), Goulburn Murray System, Murray-Darling Basin (Bjornlund and Rossini 2007)

System traded water. The majority of irrigators indicated that they found the process of trading temporary water allocations to be easy (89 %), reliable (84 %) and affordable (72 %) (Fargher and Olszak 2011).

When water trading was introduced, however, the new policy signal given to irrigators was that if you could not profitably use any water allocated to you, you should sell it someone who could. Irrigators responded accordingly and water that would have previously been left unused in the systems main dams was sold to someone who could use it. As a result, too much water was used and dam storages were run down too quickly. So much so that Brennan (2007) estimates that the apparent annual benefits of water trading were less than the cost of the increased drought-like impact of trading on the amount of water available for use in subsequent years. As soon as officials appreciated the importance of allowing the carry forward of water from one season to another allocation policies where changed (Young 2010).

In retrospect, the golden rule, now realised by all Australian governments, is that if water trading is introduced, it must be possible for irrigators to decide that the optimal strategy is to carry forward water from 1 year to the next – especially when water supplies are low.

20.7 Cost Effectiveness

There has never been a formal assessment of the administrative costs of unbundling the water licence systems maintained in each Australian State. A case study has, however, been completed for the Gwydir Valley (Young and Esau 2013). The first

step in this process, involved building water entitlement registers and running the processes necessary to register them. Prior to this step, licences were attached to land titles and often lacked clarity as to who really "owned" the water licence. Whilst the department may have issued the licence to a farmer, the land title on which the irrigation occurred may be held jointly in the names of three people. To make matters even more complicated, one of the people on the title may have deceased or be in the process of going through a divorce. On a case by case basis, each licence had to be examined and, once all issues resolved, placed on a register.

The interests of banks also had to be considered. Prior to the separation of water entitlements from land titles, the value of land included the value of all the water licences associated with it and banks used these titles as security. As water entitlements were separated from land titles, registers had to be built in a manner that enabled third parties to formally register an interest in a water entitlement. Once this had been done, each register had to be validated in terms of ownership and banks given the chance to renegotiate an appropriate level of security. In each state, this process took several years.

At the same time, bank-like water allocation accounts had to be established and arrangement put in place to ensure that these accounts had integrity. Today, every entitlement is linked to a water account and the holders of these accounts can transfer water from their account to another account. In the most sophisticated systems, these transfers can be executed over the Internet in a manner that is similar to the processes used to transfer money from one account to another (Young and McColl 2002).

In all cases, the government picked up the costs of establishing registers, building water accounting systems, etc. at the State level. Within some irrigation areas, however, in a parallel set of reforms ownership of the water distribution systems where transferred at no charge from the government to water supply companies owned entitlement holders. Whilst this enabled irrigators to take control of "their" water supply system, it meant that they, not government would be responsible for the full marginal costs of water supply. The result, once again, was a dramatic increase in the efficiency of water delivery. In the case of the Murrumbidgee Irrigation System, for example, the transfer of responsibility for management of this supply system to irrigators in 1999 resulted in a real reduction in management costs for each of the next 6 years. The NSW government, however, found it necessary to almost continuously increase bulk water charges over this period (see Fig. 20.5).

Throughout the Murray-Darling Basin, water now trades on a daily basis and a complex array of water supply and information systems have been developed by government and by industry. A water broking industry has been established. Figure 20.6 provides an overview of the relationship between water trading and the volume of water available for use. As theory predicts, in times when allocations are low, trading is high and vice versa.

The extent to which water trading has also improved water use can be seen from Fig. 20.7. As a result of the long dry in the first decade of this century, the amount of water diverted for irrigation in the Murray-Darling Basin declined from nearly 12,000 to 2,000 GL but the Gross Value of Irrigated Production only declined from

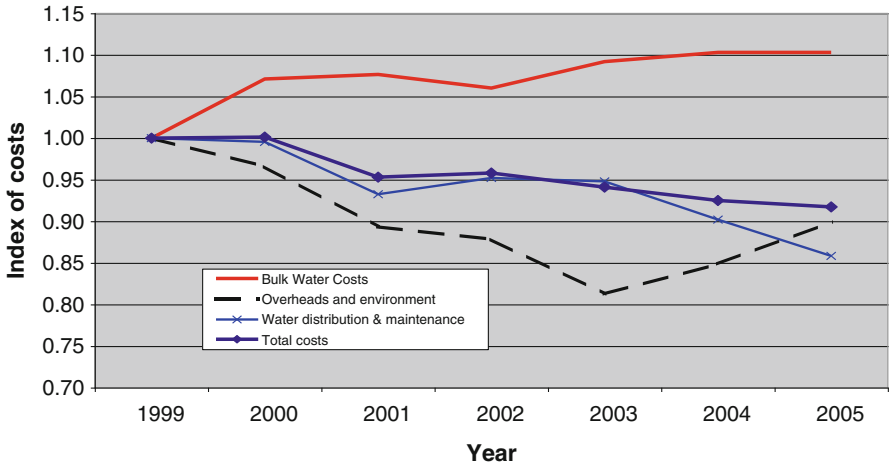

Fig. 20.5 Example of the efficiency obtained by transferring ownership and responsibility for operating the Murrumbidgee Irrigation system to irrigators (Young et al. 2006)

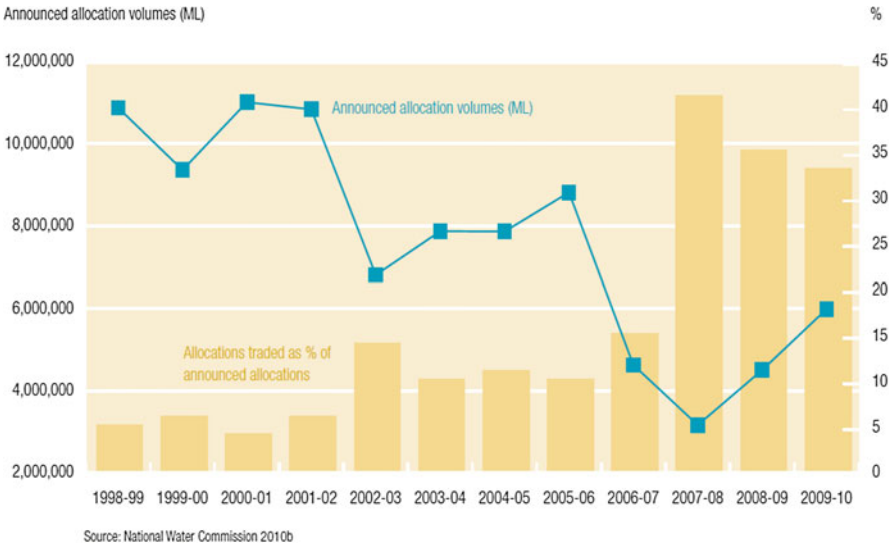

Fig. 20.6 Relationship between announced water allocations and the volume of water traded (Fargher and Olszak 2011)

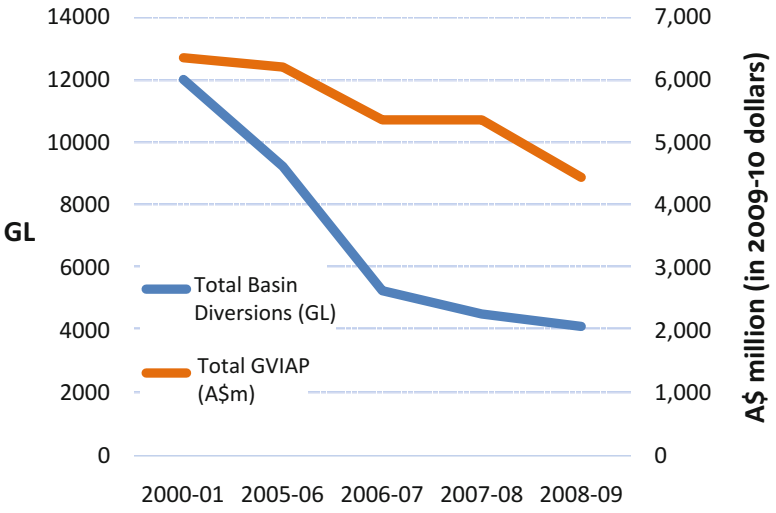

Fig. 20.7 Change in the total value of irrigated agricultural production and the amount of water used in the Murray-Darling Basin, 2000–2001 to 2008–2009 (Gooday pers. com., 2011; presentation to ACCC Conference Brisbane)

A$7.5 billion to A$4.5 billion. That is, an 80 % drop in water availability only caused a 40 % decline in the gross value of production.

20.8 Distributional Effects and Social Equity

Until recently, all the distributional effects of the introduction and development of water trading were found to be positive. Few people were made worse off and many were made better off as the value of water entitlements increased and people voluntarily choose to sell water because they could make more money from selling this water than using it. Many also chose to sell water to finance investment in new more efficient irrigation technology.

Towns and local communities also appeared to benefit from these changes even though local shop keepers complained that the trade of water out of their region was not in their best interests. Case study and focus group work, however, has found it very difficult to find concrete examples of situations where this was the case (Young et al. 2006).

As the extent of the Murray-Darling Basin's over-allocation problems have become more apparent, however, a new suite of distributional effects have become apparent. As already mentioned in an attempt to resolve the over-allocation problem, the Australian Government has been buying water entitlements for the environment from irrigators willing to sell some or all of their water to them. From the perspective of a person selling a water entitlement the transaction, given the

circumstances faced by that person, is normally worthwhile – otherwise they would not have agreed to the sale. From the perspective of other irrigators in a district, however, the transfer of water out of a district can mean that the unit costs of supplying water to remaining irrigators can increase.

Local businesses often take a similar view as with less water in the district opportunities to sell goods and services are less. While this argument is often put, however, empirical evidence of this occurring is proving difficult to find as the considerable proportion of the money received by irrigators when they sell a water entitlement to the Government is re-invested locally. Dixon et al. (2011), for example, report that a 23 % reduction in water entitlements in the Southern Connected System is likely to produce a slight positive increase in regional income because irrigators are paid for the water entitlements they sell and the money they receive is re-invested. Nevertheless, governments are finding that perceptions of the negative impacts that actions like this are predicted to have a very real. Political opposition to current buyback policies is considerable – to say the least.

20.9 Institutional Context

A range of different institutional arrangements underpin Australia's approach to water reform. A recent political imperative was the emergence of an 8-year long dry period in the last decade right throughout Australia. Water – at least water shortage – rose to the top of the political agenda. Every mainland capital city, except Darwin, was placed on major water restrictions. Irrigation allocations to many irrigation entitlement holders was zero. In such an environment, the public is looking for and expects water policies to change. In the middle of this dry period, the Australian government was able to produce a National Water Initiative that set the context for many of the reforms that followed. It also made it possible for Australia's Federal Government to propose to "take over" management of the Murray-Darling Basin and establish a new Murray-Darling Basin Authority.

20.9.1 Unbundling

Unbundling commenced in 2000 in the State of New South Wales and is now required under the National Water Initiative. It has now been implemented in all States in the Murray-Darling Basin.

A quite complex suite of administrative arrangements had to be put in place to enable the unbundling of the water licensing system originally used to allocate water in Australia. In most cases, a new water act was drafted and then approved by Parliament. Under the new regime, water entitlements are a special form of a property right. The term "property right", however, is rarely used by Australian administrators as they have found it easier to talk about the nature of each person's

entitlement and avoid getting tangled up in debates about the nature of people's rights. The right issued is officially described as a "Water access entitlement."

Access entitlements take the form of a share and are usually issued in perpetuity. Once the system is set up the only way to secure an entitlement to a share of water in a system is to purchase a share from an existing share holder.

Ownership of entitlements is vested in individuals and arrangement put in place to enable water to be traded from one irrigation district to another.

Water supply companies are allowed to charge people who permanently transfer water entitlements from one irrigation district to another an exit fee.

To prevent unfair behaviour the maximum fee that may be charged is regulated by a national market regulator (the Australian Competition and Consumer Commission).

Allocation trades are implemented by debiting one person's water account and crediting another person's water account.

Entitlement trades are implemented by amending names on a water entitlement register. Entitlements can be mortgaged.

Brokers are used to bring buyers and sellers together and settle each trade.

Administrative arrangements have also been unbundled. Under a new National Water Act (2007), a Murray-Darling Basin Authority has been established and this Authority given responsibility for developing a new Basin Plan which amongst other things will define the maximum amount of water that can be diverted from each water resource in the Basin. State Governments are then responsible for developing and implementing a water sharing plan for each region. Use approvals are managed locally.

20.10 Transaction Costs

A large amount of attention has been given the development of arrangements that reduce transaction costs associated with trading. In particular, a series of rules have been developed in an attempt to prevent irrigation districts for discouraging trade out of their district and also to prevent States from preventing the transfer of water out of their state. Tables 20.1 and 20.2 below summarise the water allocation and trade service standards that government now try to comply with.

Table 20.1 Water allocation trade service standards (implemented from 1 July 2009)

State and territory	Intrastate trade approval	Interstate trade approval
New South Wales, Victoria Queensland, Australian Capital Territory	90 % of allocation trades within 5 business days[a]	90 % of allocation trades within 10 business days[a]
South Australia	90 % of allocation trades within 10 business days	90 % of allocation trades within 20 business days

[a]All interstate trades except for trades with South Australia, which would be consistent with standards set out above for South Australia

Source: Own elaboration

Table 20.2 Water entitlement trade service standards (implemented from 1 July 2009)

State and territory	Intra and interstate trade approval	Intra and interstate trade registration
Trade approval/rejection time	Total amount of time taken by the relevant water authorities to approve or reject a trade application received from the buyer or seller	
	The time excludes the duration when the application is back with the buyer or seller due to incorrect/incomplete information and include the approval/rejection times for all water authorities involved in processing the trade	
Trade registration time	Total amount of time taken by the relevant water authorities to register a water entitlement trade in the water register after receiving the relevant transfer documents/registration application from the buyer or seller	
	The time excludes the duration when the application is back with the buyer or seller due to incorrect/incomplete information and include the times for all water authorities involved in adjusting the water accounts and registering the trade	

Source: Own elaboration

20.11 Policy Implementability

The choice of the EPI in this case derives from an initial decision to develop water markets as part of National Competition Policy. At the time, the Australian Government decided that it was critically important the Australia became more competitive. Water was included as part of this agenda. If this commitment had not been made then it is likely that much less progress would have been made. Significantly, any state that failed to comply with the Australian government's competition policy agenda was fined many millions of dollars. Implementation of water reform, in political practice, was mandatory.

One of the driving factors underpinning this policy reform was a significant and early increase in the value of water entitlements. Although many problems emerged, and had to be dealt with, all understood that abandonment of this new policy would result in a significant decline in the personal and newly found wealth that the increase in the value of water entitlements generated. Soon after the reform was implemented, it became clear that Australia would probably always have water markets – at least in the Southern Connected River Murray system. Any government that stopped water trading would be accused (rightly) of causing a massive decline in the wealth of a significant group of people.

20.12 Conclusions

The main conclusion and arguably most significant observation that can be made from the development of water trading in Australia is that it takes time. The development to this EPI has taken over 20 years and, at least, another 10 years of reform is

expected as progress is made in the resolution of over-allocation issues and improving water markets.

A second conclusion is that unbundling has made it easier to resolve issues one by one. It also makes it much easier for individuals to adjust and innovate. New business and new technology must be expected to emerge with each reform that is made.

20.12.1 Lessons Learned

Over all the assessment from an individual water use perspective is that the introduction of this EPI has succeeded. From a national perspective, most experts also describe it as a success. When one looks carefully, however, it is clear that Australia got the reform sequence wrong. As a Nation, Australia would have been better off if it had solved the water accounting and over-allocation problems before it introduced water trading.

In a report to the OECD (Young 2010) draws attention to the following lessons:

- *Lesson 1*: *Unless carefully managed*, *the legacy of prior licensing decisions can result in markets causing over-allocation problems to emerge in a manner that erodes the health of rivers*, *aquifer and the water dependent ecosystems associated with them*.
- *Lesson 2*: *Transaction and administrative costs are lower when entitlements are defined using a unit share structure and not as an entitlement to a volume of water*.
- *Lesson 3*: *Market efficiency is improved by using separate structures to define entitlements*, *manage allocations and control the use of water*.
- *Lesson 4*: *Early attention to the development of accurate licence registers is critical and a necessary precondition to the development of low-cost entitlement trading systems*.
- *Lesson 5*: *Unless water market and allocation procedures allow unused water to be carried forward from year to year*, *trading may increase the severity of droughts*.
- *Lesson 6*: *Early installation of meters and conversion from area based licences to a volumetric management system is a necessary precursor to the development of low cost allocation trading systems*.
- *Lesson 7*: *It is difficult for communities to plan for an adverse climate shift and develop water sharing plans that deal adequately with a climatic shift to a drier regime. More robust planning and water entitlement systems are needed*.
- *Lesson 8*: *The allocation regime for the provision of water necessary to maintain minimum flows*, *provide for conveyance and cover evaporative losses need to be more secure than that used to allocate water for environmental and other purposes*.
- *Lesson 9*: *Unless all forms of water use are accounted for entitlement reliability will be eroded by expansion of un-metered uses like plantation forestry and farm*

dam development, *increases in irrigation efficiency*, etc. *and place the integrity of the allocation system at risk*.

- *Lesson 10*: *Unless connected ground and surface water systems are managed as a single integrated resource*, *groundwater development will reduce the amount of water available that can be allocated to surface water users*.
- *Lesson 11*: *Water use and investment will be more efficient if all users are exposed to at least the full lower bound cost and preferably the upper bound cost of supplying water to them. One way of achieving this outcome is to transferring ownership of the supply system to these users*.
- *Lesson 12*: *Manage environmental externalities using separate instruments so that the costs of avoiding them are reflected in the costs of production and use in a manner that encourages water users to avoid creating them*.
- *Lesson 13*: *Removal of administrate impediments to inter-regional trade and inter-state trade is difficult but necessary for the development of efficient water markets*.
- *Lesson 14*: *Markets will be more efficient and the volume of trade greater if entitlements are allocated to individual users rather than to irrigator controlled water supply companies and cooperatives*.
- *Lesson 15*: *Equity and fairness principles require careful attention to and discipline in the way that allocation decisions and policy changes are announced*.
- *Lesson 16*: *Water markets are more effective when information about the prices being paid and offered is made available to all participants in a timely manner*.
- *Lesson 17*: *Develop broking industry and avoid government involvement in the provision of water brokering services*.

20.12.2 Enabling/Disabling Factors

At the highest level, these lessons and the framework that emerges from them are readily transferable to other countries. In many cases, however, the first step is likely to require significant property right reform. Australia was lucky. It started, accidently, with an approach to the development of its water entitlement and allocation system that made it relatively easy to introduce a market. The starting point was a property right system that was fungible or at least through unbundling made in to a fungible asset. If Australia had started with a seniority allocation system, such as that used in much of the USA, this would not have been possible.

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