How do water markets function in droughts and other hard questions: Learning from law reform in Australia.

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Abstract

Parts of Australia are going through a period where rainfall is the lowest since records were collected. The drought has brought water issues to the forefront of national concern. Since 1994 Federal and state governments in Australia have embarked on an ambitious agenda for reform. The reforms were based on two main objectives – to introduce a water market while at the same time protecting environmental uses of water. Water entitlements were required to be specified in order to be traded. In 2004 the Council of Australian governments confirmed the direction for reform and agreed on a further reform agenda called the National Water Initiative (NWI). In this new phase, the tensions between the two main objectives of trade and sustainable management continue to be resolved through catchment wide planning processes. Reform has made progress for example the building of reliable registers of water entitlements roughly based on registers of land title. Water planning is in place in all jurisdictions and processes have improved. Significant challenges exist - overallocation of water has not been satisfactorily addressed; water plans are still not based on sustainable management; decision-making in planning needs to be made more transparent; engagement with stakeholders need improving, and the structure of legal entitlements to water needs refining.

Keywords: drought, jurisdictional disputes, Murray-Darling Basin, North Australia, overallocation, public participation, transboundary rivers, water entitlements, water markets, water plans

Introduction

Parts of Australia have experienced the lowest rainfall on record since at least 1900 when data started to be collected.[1] Serious or severe rainfall deficiencies affect southern and eastern Australia in a broad arc extending across southern South Australia, most of Victoria and NSW, and a large part of southeast Queensland. Storages across the country, particularly in the Murray and in South East Queensland are at record lows. In the former, storages are at 13 per cent capacity. By May 2007, these will be empty.[2]

Most of the cities in Australia are subject to water restrictions. The most severe is in south east Queensland. On 10 April 2007 householders in the fastest growing region in Australia will face Level 5 water restrictions.[3] Households which use more than 800 litres a day of water will be asked to file a water usage audit report to provide information on their household, water use and water efficiency. Certain types of water use will be banned. The target is for individuals to use no more than 140 litres a day.

For the rural sector, the drought has brought social and family disruption far beyond that felt by city dwellers, with rural suicide rates receiving widespread attention in the media. Some farmers in New South Wales will not get one drop of water from their water entitlements.[4]

Water reform has been on high the political agenda for over 10 years in this country. I will give a broad summary of the factors that gave rise to that policy and law reform, and a description of the features of the new legal framework for water. I will outline where early reform has succeeded and give a concise analysis of the problems that have been encountered in the implementation of the reform. As the reform framework relies on water resource planning, I consider issues relating to participatory planning in water and suggest how this may be addressed particularly in remote communities.

1. A snapshot of Australia's water

Australia is an old continent, with areas that are prone to salinity problems. Water is scarce, and its supply is variable. It has some of the wettest areas on earth. It also has areas that experience prolonged droughts, seasons of low and variable rainfall broken by sweeping floods. Groundwater is an important part of the resource. Due of the relative dryness of the continent, Australia has the highest per capita storage capacity of all countries in the world, over four million litres per person.[5]

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[1] These record low falls occurred in a strip from Melbourne, Victoria to central NSW, southern Queensland and much of Western Australia's west coast. See Australian National Climate Centre, 'Statement on Drought for the 12-month period ending 28th February 2007' 6 March 2007 at http://www.bom.gov.au/climate/drought/drought.shtml.

[2] Asa Wahlquist,'A big drought should bring big ideas with it' *The Australian*, 24 February, 2007 http://www.theaustralian.news.com.au/story/0,20867,21276403-28737,00.html.

[3] Tuck Thompson, 'Blitz on water rorters', *Courier Mail*, 1 March 2007, 10-11.

[4] Asa Wahlquist,'A big drought should bring big ideas with it' *The Australian*, 24 February, 2007 http://www.theaustralian.news.com.au/story/0,20867,21276403-28737,00.html.

[5] Australian Bureau of Statistics *2007 Year Book Australia* (Catalogue No. 1301.0, Dennis Trewin, Canberra)

Much of the water is supplied by organised service providers or public dams. But in many catchments in Northern New South Wales and Queensland, Western Australia water users directly access their water either through pumping groundwater or dams. 85 per cent of water used within the Australian economy was extracted directly by water users. [6] Approximately 80 per cent of water used was supplied from surface water (rivers and overland flows) with groundwater resources accounting for the remaining 20 per cent.[7]

Prior to colonisation, Indigenous people exercised communal property rights over water. Under British colonial rule, the English common law became the basis of management of water resources. It soon became apparent that common law rules were inadequate. There were concerns that efforts at water supply and irrigation would be undermined by common law claims. In 1886, after world-wide study of approaches to water supply and allocation, Victorian legislation vested the right to use water in rivers, lakes, swamps etc. in the Crown. A royal commission in New South Wales made similar recommendations.

Reform occurred in the late 19th century imposing an administrative (licensing) regime in all states. Water is vested in the State. Water for urban supply and mining was generally granted directly by specific acts of legislation. But the majority of grants of water for irrigation took place by the licensing system established under water statutes. In that time public policies promoted increased water use, and farmers were charged for water they were entitled to take under their grants regardless whether all of it was used. The price of water was also heavily subsidised. Storages and supply systems were mainly publicly funded.

A great variety of administrative grants with different tenure, rights and obligations (collectively referred to in this paper as 'administrative grants') developed over the years. In each of the States, and regions within those states, water managers had a great deal of autonomy over how they expanded the supply of water. Many of the differences in these administrative grants relate to the subtleties associated with local land use and development.

The type of crops grown in a region/state also determined how dams were managed. Where horticultural crops were grown, dams were managed conservatively. This meant that water was held for several years in large storages to ensure there was enough for supply during dry years. In regions where rice or cotton, both annual crops, were grown, then the policy was to let as much water be used in a wet year. In a dry year these crops were simply not grown at all. As we will observe later in the paper, these patterns of management became institutionalised as part of a post-reform water entitlement.

The main period of expansion took place within a fifty year period of the twentieth century that was a relatively wet period. During these years rivers were treated as supply channels for irrigation. This disrupted their natural flow patterns. Wetlands

[6] Australian Bureau of Statistics, 'Water Account, Australia, 2004-05' 28/11/2006 at http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyReleaseDate/9F319397D7A98DB9CA256F4D007095D7?OpenDocument [hereafter Water Account 2005]

[7] Australian Government, Department of Agriculture, Fisheries & Forestry *Australia – Our natural resources at a glance 2007* (Commonwealth of Australia, 2007)

were drained for agricultural use, and so much water was pumped that rivers are running dry. Floodplains and ecosystems have been affected. Overallocation of water is now a significant issue.

Consumptive use of water is shown by the following table:

Table 1: Water consumption in Australia 2004-2005[8]

Sector	**Use**
Agriculture	65%
Household	11%
Water Supply Industry	11%
Manufacturing, Mining, Electricity & Gas	3%
TOTAL	100%

Water consumption patterns in Australia have changed significantly since the 2001-2002. Overall water consumption has decreased by 14 per cent with the greatest reduction (19 per cent) being within the agricultural sector. [9] Household water use has decreased by an average of 8 per cent.[10]

2. Co-operation in water law reform

When Australia became a federation in 1901, inland rivers had already been used for decades as highways for getting produce to markets. They were also very important to the states for irrigation. To reflect the states' concerns, the Constitution was silent on the issue of water resources therefore according to common law principles about sovereign legislative power, this power remained with the states.[11] The only explicit reference to water resources is found in s 100 of the Constitution which reads

> *The Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a State or of the residents therein to the reasonable use of waters of rivers for conservation or irrigation.*

Thus the Commonwealth's powers over water came from its power to legislate for defence, trade and commerce, and external matters. In practice the Commonwealth has had an important role in the management of the internal waters of Australia through policy formulation and the provision of financial assistance for schemes related to water resources.

[8] See [Water Account 2005] note 6
[9] See [Water Account 2005] note 6
[10] See [Water Account 2005] note 6
[11] See SD Clark and IA Renard, 'Constitutional, Legal and Administrative Problems' in HJ Firth and G Sawer, *The Murray Waters: Man, nature and a river system*, (Sydney: Angus Robertson, 1974) pages 265-266.

By the late 1970s it became apparent in the heavily irrigated states of Victoria and NSW that water was over allocated. The main problems were:

- The lack of security for entitlement holders. They were like members of a club that kept taking in new members, resulting in the erosion of the enjoyment of the club facilities. In addition membership rights were not clearly specified. Managers determined the rules of water access. In parts of NSW there were a few examples where managers had seriously underestimated losses in the 'system' and later that year had to cancel water that had been promised to farmers.
- Governments were authorised to revoke the entitlements for 'bad behaviour' but this did not happen.
- Entitlements were often limited to a definite period (this period varied from state to state) but again the rights were simply rolled over to a new period.
- The legal regime did not recognise that the environment was a legitimate user of water.[12]

Early measures were put in place in the form volumetric allocation schemes, embargoes on new water licences, temporary and permanent trade of licences particularly in Victoria and NSW.[13] These did not adequately address the two main problems of water use – the opposing demands of security for consumptive users and the growing awareness that water needed to be allocated to ecosystem needs.

Wide scale reform was sparked by Industry Commission findings 1992 that the Water 'industry' was inefficient and unsustainable. The enquiry recommended -

- Payment of full cost of use by users
- Integrated approach to water management
- Institutional change – separating water provision from resource management, standard setting and regulatory enforcement
- Tradeable water rights to allow re-allocation of water from unproductive uses to efficient uses.

This report was handed down in a political climate that augured well for its adoption. International treaties and conventions placed obligations on the Commonwealth government to manage natural resources in a sustainable manner and to protect biodiversity. Domestically, commonwealth, State and local governments adopted a new cooperative approach to environmental matters. This approach is exemplified by the Intergovernmental Agreement on the Environment concluded in May 1992.[14]

2.1 National Water Reform Framework, 1994

The Council of Australian governments (COAG) comprising federal, state and local governments in Australia embarked on an ambitious agenda for reform in 1994. They

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[12] PL Tan, *Legal issues relating to water use, Issues Paper No.1,* Murray-Darling Commission Project MP2002, Report to the Murray-Darling Basin Commission, 2002 reprinted in *Property: Rights and Responsibilities, Current Australian Thinking*, Canberra, Land and Water Australia, 2002.

[13] For details see note 12

[14] Australian Government, Department of Environment and Water Resources, *Intergovernmental Agreement on the Environment*, (Canberra: Australian Government Printing Service, 1992). See also Jacqueline Peel and Lee Godden, 'Australian Environmental Management: A "Dams" Story', 28 *UNSW Law Journal*, 668, 676 (2005)

recognised that better management of Australia's water resources was a national issue and agreed on a Water Reform Framework. The reforms were based on two main objectives – to introduce a water market while at the same time protecting environmental uses of water. A raft of actions were required including –

- separating water access entitlements from land titles,
- allowing for trade in water entitlements, both intra and interstate,
- consulting the public where new initiatives are proposed especially in relation to pricing, specification of water entitlements and trading in those entitlements,
- making explicit provision for environmental water and where river systems were over allocated to provide for a better balance in water use, and
- separating the functions of water delivery from that of regulation.

As a result, over the last decade states and territories have a significant program of reforms to their water management regimes. All jurisdictions have introduced new legislation and statutory water plans.

2.2 The National Water Initiative (2004)

Australian governments revisited policy-making in 2003/4 and agreed on the National Water Initiative (NWI).[15] This policy document, agreed on after months of negotiations between states confirms the direction of earlier reform, recognises that more work needs to be done and sets new and specific targets.

It seeks to achieve nationally-compatible trading system and to that end states that entitlements are to be exclusive, tradeable, enforceable, defined separately from land and as a perpetual share of a specified water resource.[16] Registers of entitlements are to be set up. Among an extensive list of measures required, the NWI seeks to remove institutional barriers to permanent trades by 2014.

The NWI sets a detailed implementation schedule. Water planning is critical to the NWI outcomes is the instrument which delivers both a highly specified 'product' for trade while at the same time providing for sustainable management. Achievement of the central objectives of the reform depends on comprehensive planning systems based on full basin wide hydrological assessment of the resource. A cardinal principle that underpins planning is that water users, interest groups and the general community are to be involved as partners in catchment planning processes. The baseline for planning is sustainable management

> *…all water bodies, no matter what level of modification is accepted as the appropriate balance between production and the environment, must be maintained in or restored to an environmentally sustainable condition as the first priority of management.*[17]

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[15] Council of Australian Governments, *Intergovernmental Agreement on a National Water Initiative,* (25 June 2004) available online at http:/www.coag.gov.au/meetings/250604/iga_national_water_initiatve.pdf [hereafter NWI]

[16] See [NWI] note 15, s 31

[17] Daniel Connell and Stephan Dovers, 'Tail wags Dog – Water Markets and the national Water Initiative', July- September 2006 *Public Administration Today* 18 (2006)

3 An assessment of water reform

Where has reform succeeded? I will point to three areas of successes

First, an independent 'watch-dog' has been set up to assess compliance with policy. The National Water Commission, a statutory body was set up in 2004 to drive the national water reform agenda.[18] It provides advice to CoAG and the Commonwealth Government on national water issues. Commissioners are appointed in recognition of their skills for example expertise in water resource policies and relevant scientific disciplines. One of its main functions is to assess governments' progress in implementing the NWI which sets national standards for water reform. This is done through biennial assessments of progress commencing in 2006–07.

Secondly, a water market has been established. Trade in surface administrative grants were introduced in 1983 in NSW and when introduced was restricted to temporary trade between irrigators within the same irrigation district. Over time permanent trades were allowed, but markets worked in a limited fashion. Since the 1994 reforms, the legislative barriers for trade have been minimised. For example in Queensland within a catchment, there is what can be considered a trading zone. If the proposed trade, whether temporary or permanent complies with the Water Resource Plan (WRP) for that catchment, then there are very limited procedures to comply with. Only if the trade falls outside of the WRP then procedures such as public notice, objections, scientific reports supporting that externalities are not significant etc are required.

In 1998 the Murray Darling Basin Commission (MDBC) put in place a pilot interstate water trading project between NSW, Victoria and SA. Trade within the southern Murray-Darling Basin (MDB) has been most active. However water trade outside the MDB is limited mainly because the lack of hydrological connectivity and a lack of demand for water relative to supply and availability.[19]

Thirdly, public attitudes are changing with options of recycling and desalination taken seriously. In 2006 Toowoomba – a country town in Queensland which is fast running out of water - planned to spend $68 million on recycling water to add to drinking supplies. When the council's plan was put to a referendum, two thirds of residents voted against it. However this is not indicative of wider community views. An overwhelming 70% of Australians are now prepared for recycled water to be added to potable supplies.[20]

Political commitment to water reform means that money is available for the reform agenda. Over 13 billion dollars will be allocated in the period 2006-2011 for national

[18] Commonwealth of Australia, *National Water Commission Act 2004* [hereafter NWC]
[19] Productivity Commission, *Rural Water Use and the Environment: The Role of Market Mechanisms*, Research Report (Melbourne: Productivity Commission, 2006) [hereafter Productivity Commission].
[20] Selina Mitchell, '70pc would drink recycled sewage', *The Australian*, 26 December 2006, page 1. 1200 people participated in a poll conducted for the newspaper. 69 per cent of respondents were prepared to accept treated effluent for household use including drinking if treated to the same quality as current supplies. 29 per cent were prepared to accept it for non-drinking purposes. Only two per cent opposed any use of recycled effluent.

water projects. Infrastructure solutions still dominate the water reform agenda, for example desalination plant in Western Australia costing $387 m, a water pipeline in Queensland costing $500 m, and a water recycling plant in NSW $500 m. The allocation of money is still very much subject to political pressures.[21]

3.1 Constitutional barriers and the 2007 'Water Security Plan'

Rivers and aquifers are transboundary resources, and the most prominent example is the MDB. The major river system running through the basin, the Murray-Darling, is Australia's largest and one of the world's major river systems. The basin comprises 14 percent of Australia's total land mass across four states. It is an important bio-region: within it is found over 30,000 wetlands some of which are listed under the Ramsar Convention of Wetlands of International importance. Irrigated agriculture in the Basin has had a history of over 140 years and accounts for an estimated 70 – 72 per cent of all irrigation water use in the country.[22]

Figure 1: Murray Darling Basin (Murray Darling Association, 2007)

The MDB is governed by an inter-jurisdictional pact which has its historical roots in the early 1900s. Presently an agreement exists between the governments of New South Wales (NSW), Victoria, South Australia (SA), Queensland, the Australian Capital Territory (ACT) and the Commonwealth.

In 1996 the Murray Darling Basin Ministerial Council imposed a Cap on extraction of water for consumptive use. It was set at a level of extraction under management rules and infrastructure development as of 1993/94.[23] Connell observes that this reference

[21] Fiona Carruthers, 'Politics muddies $13bn water reform plan', *The Australian Financial Review*, 19 May 2006, pages 1, 80-81.
[22] See [Productivity Commission], note 19
[23] The Cap formula 'is the volume of water that would have been used with the infrastructure (pumps, dams, channels, areas developed for irrigation, management rules etc) that existed in 1993/94, assuming similar climatic and hydrological conditions to those experienced in the year in question'. Murray Darling Basin Commission, *Annual Report*, (Canberra: Murray Darling Basin Commission, 2000) at page 66.

point has almost no connection with environmental perspectives and provides first for the need for production.[24] States were responsible for implementing the Cap. Annual Independent audits showed that NSW regularly breached the Cap and Queensland had not set a state target as was required.

A review of the Cap in 2000 concluded that although the Cap provided some measure of control, the activation of 'sleeper' and 'dozer' licences by trade meant that overall security of access had been reduced. Critically, because the agreed level was meant to be an interim measure from the start, the Cap level needed to be lowered in some places within the Basin. Further, as surface water allocation was reduced, groundwater was being 'mined' and the Cap needed to be extend to this sector of the resource. It was becoming apparent that the Cap was not delivering on environmental benefits for the MDB.

After lobbying by the environmental sector and South Australians, in 2002 the Murray Darling Basin Commission (MDBC) started exploring options of further reducing water extraction. The options considered included reductions of (i) 750 GL, (ii) 1,630 GL and (iii) 3,350 GL. A scientific panel was set up to assess the options. It gave the first option a 'low to moderate' probability of returning the River Murray to healthy working state. Only the third option was given a high probability of doing so.[25] Despite these findings the 'Living Murray Initiative', announced in 2004 with much fanfare, adopted a reduction level of 500 GL for use on six iconic sites.

Decision-making under the Murray Darling Agreement is slow and laborious. All signatories need to agree on measures taken and members on the governing Ministerial council reflect parochial interests. Often difficult decisions are side-stepped. The decision to Cap use in the MDB was bold, but standards adopted were low, and although this was meant to be adjusted upwards, it did not happen. Implementation of the Cap was also uneven. With the Living Murray Initiative, environmentalists say that very little water has actually been returned to the river[26]

These criticisms have been recently been validated. Attempting to break the stalemate, the Commonwealth government announced in January 2007 that $10 million will be invested over 10 years to improved water management across the nation.[27] Citing the severity of the drought in south eastern Australia, various factors such as climate change and changes in land use reducing inflows in the catchments, the Commonwealth proposed new governance arrangements 'to ensure decisions affecting it are made promptly and with a Basin-wide perspective'.

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[24] D Connell, *Water politics in the Murray Darling*, (Annadale: Federation Press 2007)
[25] Gary Jones et al, *Ecological assessment of environmental flow reference points for the river Murray system: Interim report prepared by the Scientific Reference Panel for the Murray-darling Basin Commission, Living Murray Initiative*, (Canberra, Cooperative Research Centre for Freshwater Ecology, 2003) page 18 as cited by Connell note 24.
[26] Keating, R, 'Living Murray plan 'drains faith in govts'' *Australian Broadcasting Commission* 22 February 2006, available online at http://www.abc.net.au/water/stories/s1576062.htm
[27] Australian Commonwealth Government, 'A National Plan for Water Security' 25 January 2007 available online at www.pm.gov.au/docs/national_plan_water_security.pdf

A revised Murray Darling political compact has been agreed on by all relevant states except for Victoria.[28] Participating states have agreed to legislate to refer their powers over the rivers in the MDB to the Commonwealth at the end of this year. The Commonwealth will exercise these referred powers to, amongst other things, prepare a Basin wide strategic plan setting a sustainable cap on surface and groundwater use at the Basin and individual catchment level; set Basin-wise water quality objectives direct operation on supply systems and manage water for the environment. A new MDB authority will be set up, with independent experts and not representatives of jurisdictions. That Authority will report to a single Minister and will be charged with setting a new Cap, and accredit catchments and aquifer water plans to ensure that they comply with new standards.

The federal Minister for Water intends to use up to three million dollars to buy-back access entitlements from non-viable or inefficient irrigators. This aspect of the Plan has met with criticism from within the Commonwealth government itself.[29] It is feared that irrigators who have been allocated entitlements without paying for them will now be unjustly enriched by selling to government. Without Victoria's participation, this plan cannot go ahead. The use of public funds to buy back entitlements for stemming overuse of water can be justified only if there is sufficient public confidence in the market. There are concerns that a number of factors erode the long-term availability of water in rivers. The most significant of these are climate change, the proliferation of small farm dams, afforestation, groundwater extractions, bushfires, management of surplus flows, and changes to irrigation water management and return flows.[30] Buying back of access entitlements need to be accompanied by a resolution of these issues. This issue of buying back water to address overallocation is also very much related to continuing reform of the specification of entitlements.

3.2 The specification of private entitlements is incomplete

The CoAG water reform framework required that access to water be specified as a tradeable entitlement. Specification has occurred in varying ways in states and is still subject to a high degree of difference.[31] The NWI requires that these entitlements must be subject to adaptive management. It also requires that entitlements are a right to a share of the consumptive pool of water available in a resource from year to year and not a fixed maximum volume.

Even within the water sector there is confusion over terms.[32] For the purposes of clarity it is suggested that the term 'access entitlement' refers to the specified right with the following characteristics -

- usually perpetual but capable of being adjusted in a planning cycle of 10 years
- relates to a share of a pool of water

[28] Resumed Water Summit, *Communique*, 23 February 2007 available online at www.pm.gov.au/docs/07-02-23_communique_water_summit.rtf

[29] Angus Griff and David Crowe, 'Nats threaten PM's $10bn water plan', *The Australian Financial Review*, 9 March 2007, page 1.

[30] See [Productivity Commission], note 19 page 16.

[31] In perhaps overstating the problem Shi finds over 400 types of entitlements that are still being used in the River Murray to define opportunities to access and use water. See Tian Shi, *Tackling complexity: A compatible framework for the classification, simplification and standardisation of water entitlements in the Southern Connected River Murray System*, (Adelaide: CSIRO Land and Water, 2005).

[32] See [Productivity Commission], note 19 page 45.

The periodic opportunity provided by the entitlement is commonly referred to as a 'seasonal allocation'. This is the volume of water that can be extracted, used, or sold within an irrigation season in a year. A sale (or transfer) of access entitlements is often referred to as permanent trade. The transfer of the seasonal allocation for a year or period of years is often referred to as temporary trade or renting or leasing of the entitlement.

Two examples of present entitlements illustrate the degree of variability between states. At present NSW's form of an entitlement is called an 'access licence'. It has two components. The first, the *share component*, is defined as a specified share in the available water within a specified water management area or water source. The second, the *extraction component*, is the right to take water at specified times, or rates or circumstances or a combination of these; and in specified areas or from specified locations.[33] In addition, the share component may be expressed as a specified maximum volume over a period, or a specified proportion of the available water, or a specified proportion of the storage capacity of a particular storage.[34] There are over 12 categories of access licences with differing priorities. The priorities became relevant in times of drought when allocations have to be diminished. Those of higher priority eg local water utility licences, regulated (high security) access licences will be cut back last.[35]

In Queensland, an entitlement is called a 'water allocation'. It is specified by reference to a number of matters - a nominal volume, the location from which the water may be taken, the purpose for which it is taken, any conditions attached to its use, the resource operations plan under which the entitlement is managed, and other matters prescribed under a regulation.[36] If the water is delivered in an irrigation scheme from a storage, then further particulars are required to be registered – the resource operations licence under which the entitlement is managed, and the priority group to which the entitlement belongs.[37] Alternatively if the water is pumped by the entitlement holder, then the entitlement should also state the maximum rate of taking the water, the flow conditions under which the water may be taken, the volumetric limit and the group to which the entitlement belongs.[38]

Under the NSW and Queensland models, entitlements are perpetual and capable of trade. They are reviewed under a ten year planning framework. Queensland and Victorian entitlements come with a 'security' of supply levels. This security level is embedded in Queensland within a resource operations plan, and in Victoria within a Bulk Entitlement. 'Security' is also referred to as a reliability factor. It relates to the frequency and severity of shortfalls between the quantity of water desired and the quantity of water that can be supplied. It is often indicated as a statistical probability, for example urban users in the Goulburn catchment, Victoria have 99 per cent security, meaning in 99 years out of a hundred, those users will get a full supply of water.[39] NSW entitlements do not refer to the notion of a statistical probability.

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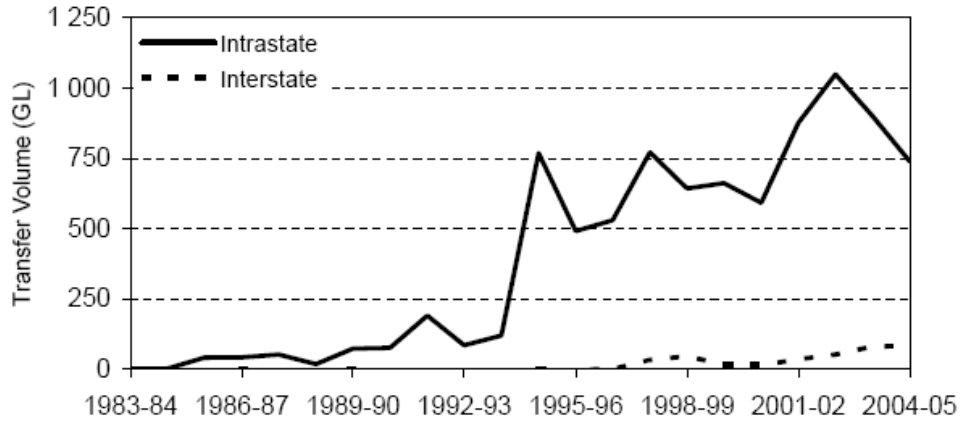
[33] New South Wales, *Water Management Act* 2000, s 56(1).
[34] Ibid s 56(2).
[35] Ibid ss 57 and 58.
[36] Queensland, *Water Act* 2000, s 127(1).
[37] Ibid s 127(2).
[38] Ibid s 127(3).
[39] *Bulk Entitlement Order (Kyabram) conversion Order* 1995 (Vic) cl 7.

3.3. **Interstate Markets not active**

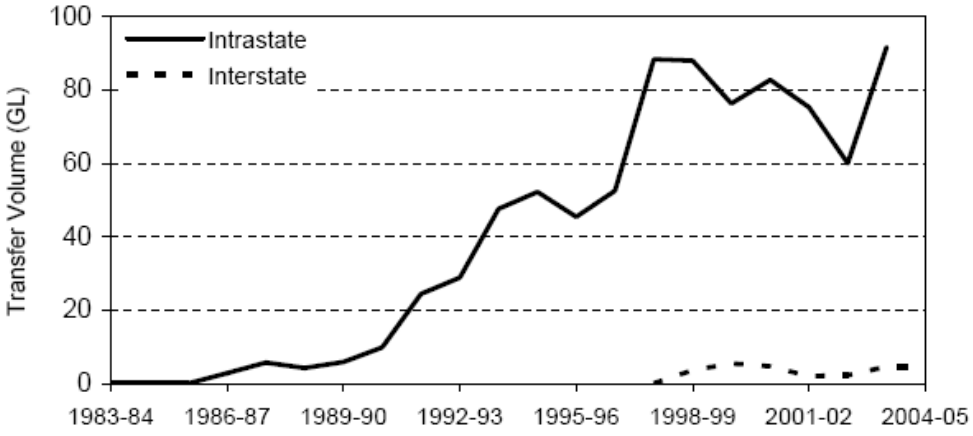
It is an objective of the NWI that states put in place legal arrangements to allow interstate trade of entitlements. States have put this in place – legislative impediments that disallow interstate trade have been mainly dismantled. As a broad generalisation interstate markets are not active.

Figure 2: Seasonal Allocation Trade in the southern Murray-Darling Basin



Source: See note 19 (Productivity Commission, 2006)

Figure 3: Seasonal Allocation Trade in the southern Murray-Darling Basin



Source: See note 19 (Productivity Commission, 2006)

It is accepted that markets work best when the product is well-specified. Because entitlements are defined in a variable manner, buyers are uncertain of the product on offer when that product comes from a different state. This uncertainty results in a reluctance to enter the interstate market and affects price.

For example in Victoria holders of high security entitlements know that even in very dry years they can expect to receive almost all of the volume of water they are promised. A security factor is attached to the entitlement, as much as 97 per cent for rural users meaning that holders can expect to receive all of the water in 97 out of 100

years.[40] In the context of climate change, whether there is level of security for entitlements is an important issue. These security factors are based on historical records of rainfall which may no longer be relied on for predicting how and where rain will fall in the future. Even without climate change, security is still an issue. Dams in Victoria have been conservatively managed. The storages are large, and as far as possible, water is held to ensure two years worth of supply of high security water in a dam.

In contrast, historically NSW entitlements are managed in a relatively insecure manner. The entitlements are framed as a share of the resource available for consumptive use in a particular catchment. These shares are not defined with a level of security that entitlement holders expect in Victoria. Therefore Victorian farmers are wary of buying water from NSW.[41]

A high level of co-operation between SA and Victoria has resulted in an interstate trading arrangement for the River Murray based on an 'exchange-rate' system. The term refers to a rate of conversion calculated and agreed to be applied to water traded from one state (or trading zone) to another.[42] The federal government wants a collective agreement on trade between Victoria, NSW and SA, not bilateral agreements. All three states were penalised in 2006 by the National Water Commission for failing to reach agreement on interstate water trading.[43]

Do markets work in droughts? A seven year study into the market of permanent water trades in an irrigation district in Victoria shows that prices and volumes of water traded have steadily increased but prices for permanent water have half the rate of increase of temporary water.[44] What is most telling is that demand for permanent water stagnates when supply is very low and irrigators struggle to cover their short term needs. In a drought it appears that there is little water to sell and few who have money to buy.

3.4 Ecological considerations still come last

National principles developed under the Water Reform Framework and NWI accept that

- environmental flows should be given statutory recognition and have at least the same degree of security as consumptive entitlements,
- environmental flows should be determined under statutory water plans based on the best available scientific information available to sustain the ecological values of water dependent ecosystems,

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[40] PL Tan, 'Irrigators come first: A study of the conversion of existing allocations to Bulk Entitlements in the Goulburn and Murray catchments, Victoria', (2001) 18 *Environmental and Planning Law Journal*, 154, page 171.

[41] Duncan Hughes, 'States fined for failing to agree on water deal' *The Australian Financial Review*, 21 April 2006, page 21.

[42] See [Productivity Commission], note 19 page XVIII.

[43] *Id*, Victoria was fined $10 million, NSW $13 million and SA $3 million.

[44] Henning Bjornlund and Peter Rossini, 'An empirical analysis of factors driving outcomes in markets for permanent water – An Australian case-study' Paper submitted to the Twelfth Pacific Rim Real Estate Society conference in Auckland, January 2006.

- Water plans should incorporate ecological outcomes and define management arrangements to achieve those outcomes,
- A better balance for overallocated river systems and water to be reallocated from consumptive to ecological use,
- Environmental water managers be established to audit, review and publicly report on the achievement of environmental and other public benefit outcomes.[45]

In 2005 the first national audit of water resources found that ecosystems are still being short charged.[46] Only a handful of high-conservation value rivers are protected, there is inadequate knowledge of connections between surface and groundwater systems and poor understanding of overallocation of water licences.

NSW arguably had the firmest statutory commitment to providing for environmental flows. A statutory duty was imposed on the Minister to set environmental water allocations that maintain fundamental ecosystem health in priority to allocating water for consumptive uses.[47] Further provisions required that a water sharing plan must establish environmental water rules.[48] In a recent challenge to a statutory water management plan, *Nature Conservation Council of NSW Inc v The Minister Administering the Water Management Act 2000* [49] the NSW Court of Appeal found that the plan for the Gwydir River was inconsistent with the original provisions of the Act. The court went on to consider whether the plan was thus invalidated. Applying a test developed by the High Court in the case of *Project Blue sky In v Australian Broadcasting Authority*,[50] the NSW Court of Appeal held that the statutory provisions did not have the effect of invalidating a water management plan that was inconsistent with them. The High Court granted special leave to the Nature Conservation Council to appeal the decision. Quickly, the state government moved to amend the water legislation redefining environmental water, inserting a validating provision for management plans thus retroactively resolving the matter. Its actions made the appeal redundant.[51]

4. The challenges of water planning

The NWI requires more transparent and comprehensive water planning that deals with key emerging issues. A cardinal principle that underpins planning is that water users, interest groups and the general community are to be involved as partners in catchment planning processes. Despite the attempt to consult and involve the public in water reform, the scale and pace of change has meant that implementation of COAG reform and the NWI has been contentious.

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[45] Alex Gardner, Environmental water allocations in Australia' (2006) 23 *Environmental and Planning Law Journal'* 208, 214.
[46] Dennis Shanahan and Matthew Warren, 'States "fail" on water crisis, *The Australian*, 13 October 2006, page 1 and Australian Government, National Water Commission, *Australian Water Resources 2005 – discovery phase integrated them discussion paper* (Commonwealth of Australia, 2006)
[47] *Water Management Act* 2000 (NSW) s 5(3) (a) and (c).
[48] *Water Management Act* 2000 (NSW), s 50.
[49] [2005] NSWCA 9.
[50] (1998) 194 CLR 355.
[51] For an analysis of the NSW legislative provision see [Gardner] note 45 at pp 215 to 219.

The most critical finding of the report is that water planning, the cornerstone of NWI reforms is weak. In October 2006, the AWR 2005 released the first of two levels of assessment which identified a number of key issues related to water planning and management. They are:

> Water planning and management approaches are highly varied across Australia's 340 surface water management and 367 groundwater management units.

> At present, only 18% of surface water surface water management units and 33% of groundwater management units have a draft or final management plan in place.

> Despite physical connections between surface and groundwater, most areas are not managed from an integrated water resources perspective.

> Of the surface water management units with draft or final management plans only 22% considered groundwater, while of the groundwater management units with final or draft management plans only 65% considered surface water.

In achieving NWI objectives, challenges in water planning have been identified in several areas by a project team researching the issue in Northern Australia.

(i) Resolving science-based conflicts.
Science-based conflicts are characterised by a number of challenges, including obtaining all the necessary scientific information, providing scientific information in formats which are accessible to the public, disagreements as to whether the information is the best scientific information available, and considerable difficulty in dealing with conflicting or inconclusive technical information. The latter is particularly the case with environmental allocations where the extent of outcomes from a proposed environmental flow is uncertain.

(ii) Unclear processes, lack of procedural fairness, rushed deadlines or undue delay
Communities become highly dissatisfied in the absence of clear frameworks for collaboration and agreement on the role of community sectors, and other partners in planning.[52] In some instances committee expectations of their role and influence have not matched those of water planners, or executive levels of government. Conflictual incidents of this nature have been experienced in at least Queensland and NSW.[53]

(iii) Lack of capacity by participants
General concerns over the adequacy of public participation processes are high. There is a recognised need for all participants to be informed and effective at representing their interests, expressing their values and responding to complex problems. Often a lack of knowledge and expertise by participants, who have little understanding of the

[52] Poh-Ling Tan, 'Legislating for Adequate Public Participation in Allocation Water in Australia' 31 *Water International* 12, 22 (2006).
[53] D Cleary, 'Community Involvement in the water planning process' Paper given at Conference on Public Participation in the Australian Water Industry, 19 August 2003, Sydney and Kuehne, G and Bjornlund, B. 'Frustration, Confusion and Uncertainty – Qualitative Responses from Namoi Valley Irrigators' 33 *Water*, 78 (2006).

technical jargon used by water managers, may diminish their capacity to understand fully the various options presented for debate and decision.[54]

(iv) Lack of appropriate consultation of Indigenous peoples
Indigenous people tend to be involved to varying degrees in water planning as part of a general public participation processes. However, questions have been raised about the extent and adequacy of the mechanisms enabling their involvement. The NWI provides for direct representation of Indigenous people in water planning process that should, where possible, allocate and account for water for native title purposes. Distinct problems relating to Indigenous forms of representation, decision-making and communication need to be well understood within water policy and planning sectors and forums. It has been said that there is a 'chasm between the perceptions of the available opportunities for involvement and the reality experienced by Indigenous people'.[55] The search for appropriate and responsive processes is set in the wider context of Indigenous interests in managing decision-making over native title issues. Additionally, the lack of understanding of NWI processes by remote Indigenous communities adversely affects their ability to participate effectively in water in planning processes.[56]

(v) Power imbalances affecting participation and planning outcomes
Public participation in water planning is typified by imbalances in access to the debate - when access is allowed, the extent of access, financial support to enable access and the sorts of knowledge that are valued. Too often, specialist knowledge is the only knowledge accepted – with local knowledge particularly excluded from the debate. These power imbalances are not easily addressed by clever strategies late in the planning process. International experience strongly suggests that a clear acknowledgment and re-negotiation of these power imbalances by all parties early in collaborative planning processes lessens the chance of less empowered participant groups boycotting the process. This improves the credibility of planning outcomes and their chance of their acceptance and implementation by all parties.[57]

(vi) Not meeting statutory requirements
Gaps exist between legislative requirements and their implementation.[58] For example although legislation in NSW and Queensland provides for socio-economic impact studies to be taken into consideration in formulating a draft management plan, it was often not undertaken.[59]

A project addresses these issues through the formulation and trial of participatory tools in two large case-studies in Northern Australia. Northern Australia has the

[54] PL Tan, 'A Historical Introduction to Water Law Reform in NSW – 1975 to 1994', (2002) 19 *Environmental and Planning Law Journal*, 445.
[55] B McFarlane, 'The National Water Initiative and acknowledging Indigenous interests in planning', Paper presented at National Water Conference Sydney 29 November 2004.
[56] S Jackson, 'Compartmentalising culture: the articulation and consideration of Indigenous values in water resources management' 37:1 *Australian Geographer*, 19 (2006).
[57] A Fung and Wright, EO, *Deepening Democracy: Institutional Innovations in Empowered Participatory Governance*, (London: Verso, 2003).
[58] See [Tan] note **Error! Bookmark not defined.**.
[59] Independent Advisory Committee on Socio-economic Analysis (IACSA) 1998. *Socio-economic Assessment Guidelines for River, Groundwater and Water Management Committees.* (http://www.dlwc.nsw.gov.au/care/water/wr/pdfs/!15broch.pdf).

world's most significant concentration of river catchments that still retain their ecological integrity. Northern rivers provide valuable ecological services, internationally recognised biodiversity values and productive coastal fisheries. The Water Security Plan 2007 acknowledges the immense pressure to develop the water resources of this region. Water planning processes need to be legitimate, robust and reliable if rivers in Northern Australia are to avoid the worst of the mistakes affecting over-allocated rivers in southern catchments.

It is recognised that water planning involves making decisions based on tradeoffs between competing outcomes. Planning systems need to be transparent in the sense that there is adequate opportunity for productive, environmental and other public benefit considerations be identified and considered in an open way.[60] The NWI recognises that settling these tradeoffs require judgements informed by best available science, socio-economic analysis and community input.[61] In its 2005 Audit, the National Water Commission has found that transparency is an issue in tradeoffs between environmental and consumptive use, with concerns in NSW, SA, Tasmanian and NT.[62]

Tools considered for use in the trials include:

- conflict resolution techniques in relation to science-based disputes – initial environmental scoping process to facilitate early issue identification; joint fact finding; compulsory fact finding resorted to if the parties fail to resolve differences; after a certain period from the time negotiations have been requested, the dispute to be submitted, at the request of any of the parties to the dispute, to impartial fact-finding.[63]
- Social learning, dialogue and knowledge exchange - ways that participants can build their understanding of river systems and catchments, and the ways others interact with, perceive and value these systems and landscapes.[64]
- deliberative workshops.[65]
- multi-criteria evaluation processes.[66]
- or a combination of both deliberative and multi-criteria processes.[67]

This is one of the few projects that takes into consideration comments by Syme and Sadler that public involvement evaluation should be conducted 'in a manner that would allow it to influence the development of the participation program'.[68] The project commences in 2007 and concludes in 2009.

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[60] See [NWI] note 15 para 5.
[61] See [NWI] note 15 para 36.
[62] See [NWC] note 18
[63] ST McCreary, Gamman J K and Brooks B, 'Refining and Testing Joint Fact-Finding for Environmental Dispute Resolution: Ten Years of Success' 18 *Mediation Quarterly* 4 (2001)
[64] See for example KN Lee, *Compass and Gyroscope: Integrating Science and Politics for the Environment*, (Washington DC: Island Press, 1993) and D Yankelovich, *The magic of dialogue: transforming conflict into cooperation*, (New York: Simon and Schuster, 1999).
[65] See for example W Kenyon, Hanley N and Nevin C, `Citizens' Juries: an aid to environmental valuation? `, (2001) 19 *Environment and Planning C: Government and Policy* 557.
[66] Gal T, Stewart TJ and Hanne T, *Multicriteria decision making – advances in MCDM models, algorithms, theory and applications*, (New York: Kluwer, 1999).
[67] W Proctor and M Drechsler, Deliberative Multi-criteria Evaluation' 2006, 24 *Environment and Planning C: Government and Policy - Special Edition in Participatory Approaches to Water Basin Management*, 169.
[68] Syme, G and B. Sadler 'Evaluation of public involvement in water resources planning', (1994) 18 *Evaluation Review*, 523.

4 Conclusion

In the two centuries since colonial occupation, river systems have suffered degradation to a point that it cannot be ignored. In this time wetlands were drained, natural habitats destroyed and native species have dwindled. Ecosystems lose resilience and become accidents waiting to happen.[69] The current drought exacerbated by growing levels of water use continues the crisis.

Cooperative federalism brought about Australia's ambitious agenda for reform. The one most critical policy decision was to accept that water needed to be sustainably managed. However as we have seen in the NSW's example, even when that principle was introduced in legislation, its implementation can be in jeopardy. States tend to resile from high statutory standards when difficulties are encountered. We see that the law is a weak tool in the face of legislative and political intervention.

High level policy making brought about the NWI in 2004, providing specific actions, standards and target dates. The role of the National Water Commission to oversee reform is important. Its reports have brought about refreshing openness into water management by states who are made to account for delay or lack of success in reaching goals. The political commitment in funding reform measures is a reflection of the importance of the issue.

A number of challenges lie ahead for example the ongoing improvement in the specification of entitlements. In the face of the current drought, the most critical issue is the unpredictable nature of long term availability of water. In recognition of this, the NWI has made water planning the cornerstone of reform. Formulating transparent, comprehensive planning processes which addresses the power imbalances, builds capacity of all participants including disadvantaged groups, allows for resolution of conflicts over scientific information and its interpretation is arguably the biggest challenge for water reform.

[69] CS Hollings, 'What Barrier? What Bridges?' in LH Gunderson et al, *Barriers and Bridges to the Renewal of Ecosystems and Institutions,* (New York: Columbia University Press, 1995), pages 9, 24.