FEATURE ARTICLE

Eminent economist John Quiggin explains why Australia's current water management framework – markets for rural water, restrictions in the cities, and little trade between the two – cannot last.

Issues in Australian water policy

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The current drought, which has reportedly been described as a "thousand year event" has pushed water policy to the top of the public policy agenda, reflecting increasing concern that the long-standing problems of water policy have been exacerbated by climate change. Over the past two decades water policy has becoming an increasingly salient and controversial political issue, with the central concern being the sustainable management of the Murray–Darling Basin. The National Water Initiative announced by the Council of Australian Governments (COAG) in 2004 focused on the development of new policy frameworks for the Murray–Darling (Council of Australian Governments 2004a, b).

The severity of the current drought, and the advent of water shortages and restrictions in major cities, has brought water policy even further to the forefront of public debate, while complicating efforts to find long-term solutions. The aim of this paper is to describe the key issues in Australian water policy, analyse policy responses, and discuss some of the most important interactions between urban and rural water supply, climate change and variability, and the needs of the environment.

The paper is organised as follows. In Section 1 the current problems of drought and climate change are described. Section 2 deals with supply options, including new dams, desalination and recycling as well as more exotic proposals such as long-distance pipelines. Section 3 describes the problems of the Murray–Darling Basin and responses including the National Water Initiative. Section 4 describes the problems of urban water supply, and discusses the relative roles of prices and quantitative controls such as water restrictions in

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matching supply and demand. Section 5 deals with one of the most contentious policy options, that of allowing trade between rural and urban water users. Section 6 addresses the related issue of environmental flows. Finally, some concluding comments are offered.

1. Drought and climate change

Large parts of southern and eastern Australia are currently experiencing severe, and in some cases, record-breaking drought conditions (National Climate Centre 2006). These conditions are a continuation of a multi-decade trend towards hotter, drier conditions that began around 1970 (Timbal, Arblaster & Power 2006; Trewin 2006).

The effective availability of water is determined by the interaction of rainfall and temperature. Higher temperatures imply higher evaporation and therefore reduced inflows to streams for any given level of rainfall. Since 1970 temperatures have increased nearly everywhere in Australia, while rainfall has decreased in south-eastern and south-western Australia.

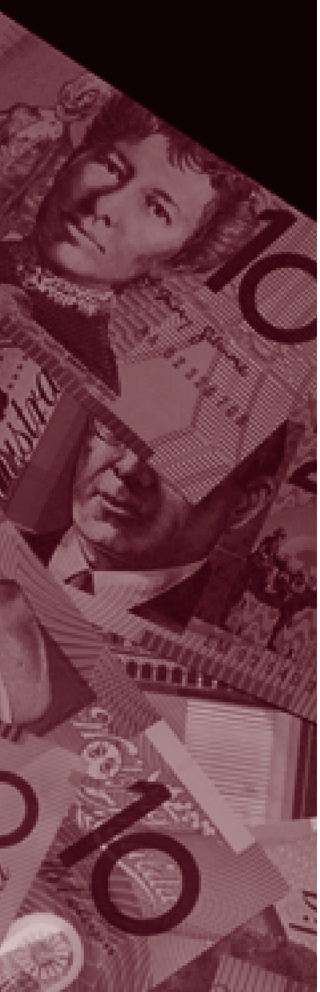
The observed increase in temperatures matches the general increase in global temperatures. The year 2005 was Australia's hottest on record, and either the hottest or second hottest for the world as a whole. While temperatures in any given year reflect a variety of factors, there is no serious doubt that the higher temperatures observed in Australia reflect global warming, caused in large measure by human activity.

Changes in rainfall are more complex. Although rainfall has been consistently below average in much of Australia, similarly low rainfall levels were observed in the early part of the 20th century. Thus, it is possible that recent declines in rainfall reflect multi-decade trends that are independent of global climate change.

However, the observed pattern of changes in rainfall are broadly consistent with the predictions of climate models (Jones et al. 2001; Timbal, Arblaster & Scott 2006). Moreover, for the purposes of water policy it does not matter whether a sustained change in rainfall has been caused by human activity or represents a long-term natural variation. If the reduction is sustained, water policy will have to adjust accordingly (Wentworth Group of Concerned Scientists 2006).

The effects of hotter, drier weather, along with changes in land and water use, are reflected most clearly in stream flows. Flows into the Murray–Darling system are the lowest recorded in over 100 years. Similarly, Perth has experienced steadily declining inflows of water to the catchments that provide its water supplies (WAter Corporation 2005).

"Changes in rainfall are more complex."



2. Supply options

The traditional Australian response to shortages of water has been to increase supply, primarily through the construction of new dams, but also through pipelines and other infrastructure projects designed to facilitate the expansion of irrigated agriculture. These projects were rarely subject to serious economic appraisal, and generally involved substantial government subsidies (Davidson 1969). There was a reaction against this approach, and an increased emphasis on conservation in the late 20th century, but proposals for expansion of supply have returned to prominence more recently (ACTEW 2005; Wahlquist 2005; WAter Corporation 2005).

Some perennial ideas can be dismissed on the basis of simple physical arguments. Water is heavy. A kilolitre (kL) of water, currently delivered to urban consumers for around 70 cents, and to irrigators for a fraction of this amount, weighs a tonne. It follows that any scheme for transporting water over long distances, without the assistance of gravity, will involve prohibitive energy costs for pumping (Quiggin 2005).

The most recent scheme of this kind to receive serious attention was the proposal by the Tenix corporation to construct a canal from the Kimberleys to Perth, a distance of 3700 kilometres. WA Opposition leader of the day, Colin Barnett, promised to construct the canal without waiting for a benefit-cost analysis. Following his defeat in the 2005 state election, such an analysis was conducted and it estimated the cost of delivered water at around $10 per kL (Kimberley Water Expert Panel 2006). The panel concluded that shipping water by tanker would be cheaper, though still far more expensive than conventional options.

The Queensland government has recently announced a feasibility study into a similar proposal, moving water from North Queensland to Brisbane, but this exercise would appear to be a waste of time and money. Even a cursory preliminary analysis indicates that it cannot be economically feasible. As has recently been suggested, it would be more economically sensible to move farming north than to seek to move water south.

Turning to more realistic possibilities, some dam sites remain unexploited and cities such as Perth and Sydney are exploiting underground aquifers. However, there are significant environmental concerns regarding the impact of dams and the sustainability of aquifers.

The "backstop" technologies for urban water supply are recycling and desalination. Substantial additional supplies could be generated using these technologies, but the capital and operating costs will be significantly higher than for traditional sources. A desalination plant is currently under construction in Perth. A proposed plant in Sydney was abandoned when it became apparent that it might only be used intermittently, resulting in high unit capital costs.

The technologies currently favoured for desalination and recycling depend on filtering using reverse osmosis. These technologies are energy intensive, and their feasibility therefore depends on energy costs.

The cost of supply of water from the desalination plant now being constructed in Perth has been estimated at $1.16 per kL, an estimate that includes the purchase of electricity generated by wind power. Other cost estimates are higher, often around $1.50 per kL, reflecting differences in the cost of constructing plants in suitable location, delivery from the plant to consumers and assumptions about operating load.

Recycling is generally less energy-intensive than desalination. However, it raises a range of real or perceived health and aesthetic concerns, reflected in the defeat of a proposal for recycling in a referendum held in Toowoomba, and in the political judgement of the Queensland government that a referendum should be held for the whole of south-east Queensland.

Options such as home-based water tanks have clear political appeal and are sensible choices under certain conditions. The ideal climate for a home water tank is one where rain falls intermittently through the year, followed by a summer-dominant rainfall pattern such as that prevailing in Brisbane. The least favourable case is a winter-dominant "Mediterranean" climate, such as that of Adelaide, characterised by a hot dry summer. In such a climate, tanks will be emptied early in the summer and remain empty for much of the period when they are most needed.

It is also necessary to consider the availability of suitable locations for the tank, which will differ from house to house. In many cases, alternative options, such as reuse of washing machine "grey water", or installation of water saving systems in gardens or showers may be more cost-effective. Under these circumstances, a subsidy policy is generally preferable to a uniform requirement for tanks in new or existing houses.

Although there are many options for increasing the supply of water, it seems clear that much of the adjustment to emerging shortages will have to take the form of reduced demand. This adjustment raises a range of issues for irrigators and urban users.

3. Irrigation and the Murray–Darling Basin

Concern about the unsustainability of the water supply policies of the 20th century first became prominent in relation to the Murray–Darling Basin. By the 1980s, the combination of increasing extractions of water for irrigation and rising salinity levels indicated that existing policies were unsustainable. The response, adopted in the early 1990s, was twofold.

First, the Murray–Darling Basin Commission implemented a Salinity and Drainage Strategy to improve water quality in the River Murray to control land degradation and, where possible, to rehabilitate land resources. The strategy is estimated to have reduced salinity levels at Morgan (the offtake for water to Adelaide) by around 100 EC units (about 20 per cent) (Department of Water, Land and Biodiversity Conservation, South Australia 2006).

Second, in 1995, a cap was imposed on extractions of water from the system. Under the cap extractions were limited to the volume of water that would have been diverted under the levels of development prevailing in 1993-94. The cap was initially an interim measure, designed to prevent unsustainable growth in water use while a more market-oriented approach was developed.

The market-based approach was first set out in the communiqué of the 1994 COAG meeting and was developed more fully in the National Water Initiative announced in 2004 (Council of Australian Governments 1994, 2004a, b). The central idea was to replace bureaucratic systems of water allocation based on licenses with tradeable water rights. It was hoped that markets would ensure that water was allocated to its most socially valuable use.

The market-based approach to policy has thus far had only limited success. A number of problems have become evident.

First, under older state-based water policy frameworks, a variety of contingent entitlements to water were issued, without charge, under constraints that meant not all of these rights could be exercised. The total volume of rights made available was unsustainable. The removal of constraints on rights should have been accompanied by a reduction in volumetric entitlements. Instead, limited and contingent rights were converted into largely unconstrained and tradeable entitlements.

The problem was most evident with "sleeper" and "dozer" rights. These were water rights that had been allocated but never used (sleepers), or which had ceased to be used (dozers). The introduction of trade gave owners of such rights an incentive to exercise them and sell them, effectively increasing the volume of extraction rights.

Second, the policy failed to take account of the water cycle as a whole. Stream flows are only a small part of a system in which rainfall initially flows over the surface of the land, or into the water table, before entering streams and river systems. Removal of water from one part of the system affects its availability in others.

Tradeable, and therefore valuable, rights over irrigation water were created, but water could be appropriated at other points in the cycle at no cost. Groundwater could be extracted from bores, surface flows of water could be captured by farm dams, and rainfall could be captured by tree crops before it even entered the system. Given the incen-

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tives, landowners rushed to capture water before controls were imposed on these processes. The initial effect of the creation of tradeable rights was, therefore, to increase the demand for water.

Despite these problems, the imposition of the cap was broadly successful in halting the unsustainable growth in extractions of water, and in laying the basis for the development of a system of tradeable water rights. The volume of trade has increased gradually over time, and there is now a significant volume of temporary trade.

However, permanent trade remains limited, both by restrictions on trade between catchments, by the absence of well-developed markets in many areas and by uncertainty about the reliability and security of water rights. While the cap represented an appropriate short-term response to the problem of unsustainable growth in irrigation, it left most of these questions unresolved.

The second major issue was the treatment of risk. The 2004 COAG meeting communiqué specified a framework that assigns the risk of future reductions in water availability as follows:

- *Reductions arising from natural events such as climate change, drought or bushfire to be borne by water users.*
- *Reductions arising from bona fide improvements in knowledge about water systems' capacity to sustain particular extraction levels to be borne by water users up to 2014. After 2014, water users to bear this risk for the first 3 per cent reduction in water allocation, the relevant state or territory government and the Australian government would share (one-third and two-third shares respectively) the risk of reductions of between 3 per cent and 6 per cent; state/territory and the Australian government would share equally the risk of reductions above 6 per cent.*
- *Reductions arising from changes in government policy not previously provided for would be borne by governments.*
- *Where there is voluntary agreement between relevant state or territory governments and key stakeholders, a different risk assignment model to the above may be implemented.*

(COAG 2004a)

The general principles set out in the National Water Initiative are consistent with the standard economic approach to risk allocation, which requires that risk be allocated to the party best able to manage it. There are, however, serious problems of implementation.

For example, suppose that long-term average rainfall declines in line with the predictions of climate change models. It will be difficult to determine whether the reduction is in fact due to climate change, or merely represents a run of dry years. Although the risk in both cases is supposed to be borne by water users, it is likely that the

appropriate response and the resulting allocation of costs between users will differ. Implementation of the principles of the National Water Initiative might therefore be difficult, or even impossible, in the absence of the information needed to distinguish between the two types of impacts.

The National Water Initiative

COAG returned to these issues in 2004 with the National Water Initiative, which subsumed the Living Murray program established by the Murray–Darling Basin Ministerial Council in 2002. As regards irrigation, two issues were central to the National Water Initiative.

The first was the development of permanent trade in water rights, and in particular interstate water trade. Despite earlier difficulties, the National Water Initiative was premised on a commitment to convert water entitlements into fully tradeable property rights and to facilitate the development of markets for those rights. A particular difficulty with the development of interstate trades has been the fact that the structure of rights is different in each state. Thus, either conversions or some form of "tagging" are required if rights are to be transferred from one state to another. Agreement has recently been reached between New South Wales and South Australia on a tagging system for trade (ABC News 2006).

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Problems of federalism

As so often happens in Australian public policy, the National Water Initiative has been the subject of dispute between the Commonwealth and state governments. It is often difficult, and usually unprofitable to allocate blame in these matters. Nevertheless, the Commonwealth got the process off to a bad start when it announced during the 2004 election campaign that its contribution to the Initiative would be funded by the withdrawal of payments previously made to the states under National Competition Policy. As a result, the states withdrew from the Initiative, returning gradually over the next year or so. The Commonwealth followed this up in 2005 by announcing that schemes funded under the Initiative would be required to adopt its preferred industrial relations arrangements.

As was the case with National Competition Policy, the arrangements established under the National Water Initiative enable a Commonwealth body, the National Water Commission, to assess the performance of the states in the implementation of the principles agreed to in the Initiative, but require no corresponding assessment of the Commonwealth's performance. The first report, issued in November 2006 rated the states' performance as poor or, at best, adequate on a wide range of issues (Turnbull 2006b). This has led to calls for the Commonwealth to take over responsibility for water policy (Milne 2006).

> There are serious problems with [NWI] implementation.

Yet there is no reason to suppose that the Commonwealth would do any better than the states. As shown by the examples above, the Commonwealth has been as willing as any state government to put short-term political objectives ahead of the long-term goals of water policy. Moreover, on most of the issues that need to be resolved if progress is to be made, the Commonwealth government is as divided as the states. Malcolm Turnbull, the Parliamentary Secretary to the Prime Minister with responsibility for water policy, clearly favours a larger role for market forces (Turnbull 2006a), but others in the government, such as Turnbull's predecessor, Gary Nairn (now Special Minister of State) are opposed, as is the bulk of the National Party. The Prime Minister's own statements on the subject have been equivocal (Hodge & Bachelard 2005).

Calls for a Commonwealth takeover of water policy have also been justified on the basis of the supposed desirability of a uniform policy approach. However, given the differences in climate and catchment hydrology between the states and the fact that, with the exception of the Murray–Darling Basin (which is already governed by well-established federal institutions) there is no real possibility of trading water between states, there is no obvious reason to expect uniformity to yield beneficial outcomes. Rather than a one-sizefits-all solution, it would be better to adopt policies based on local circumstances, and the democratic choices of local electorates.

4. Urban water

Australian cities are currently facing severe, and in most cases chronic, shortages of water, relative to the demand at prevailing prices. Water restrictions have been imposed in all the mainland capitals. Under current policy, water restrictions are permanent, or likely to become so, in most cases. By contrast, most economists have advocated increased reliance on prices as a demand management tool (Edwards 2005; Quiggin 2006).

Debates over the relative merits of price-based and quantity-based measures have been going on long enough to suggest that they are unlikely to be resolved any time soon, and also long enough to suggest that neither side is completely in the right or the wrong. The problem is to determine when to rely on the price mechanism and when to control usage directly.

One important feature of price-based policies is that they work better the longer they are in place. In the short run there may be a few easy adjustments to higher prices, but achieving substantial reductions is more difficult. Watering gardens less often, or taking shorter showers may lead to a significant loss of amenity or comfort, but if prices are permanently higher it becomes worthwhile to invest in a wide range of water-saving technologies, or to reorganise activities in ways that use less water.

The same is true on the supply side. In the short run, changes in prices make little difference to supply. In the long run, however, higher prices will be needed if new supply options such as recycling are to be economically feasible. A relatively modest but sustained increase in prices can be effective in matching long-term supply and demand.

Permanent quantity restrictions?

By contrast with prices, directly imposed restrictions on quantities used, including prohibitions of various uses regarded as wasteful, tend to work well in the short term and poorly in the long term. Particularly in the emergency context of a drought, people are generally happy to comply with restrictions, and substantial reductions in usage can be achieved. But the longer restrictions are maintained the less effective they are likely to be. Voluntary compliance tends to decline as emergency fades into normality, and people find new ways to use water which satisfy the letter, if not the spirit, of restrictions.

This pattern is one reason why it is a mistake to impose permanent restrictions on water use, as has been done in Melbourne and other cities. But there is a more important reason. If prices are allowed to do the job of matching long-run supply and demand, restrictions are still available as an option to manage short-run shocks such as droughts.

By contrast, if permanent restrictions are used to hold down long-run demand, there is little flexibility left to handle unexpected shocks like droughts or climate change. The only options are large price increases or more draconian restrictions on water use, neither of which is likely to be very cost-effective.

Likely price changes

As noted above, the likely cost of backstop technologies is around $1.50 per kL. Although this cost is significantly higher than the price currently paid by most users, it is quite modest given that the

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basic water requirement for drinking, washing and so on amounts to around 50 litres a day, or 7.5 cents a day at a cost of $1.50 per kL.

On the other hand, $1.50 per kL is equal to $1500 a megalitre, which is well in excess of the prices commonly observed for temporary trades in water rights. Hence, where it is feasible, the option of purchasing water from irrigators is likely to prove more cost-effective than alternatives such as desalination.

Equity issues

Suggestions that prices should be used to match supply and demand are frequently opposed on equity grounds, with the argument that restrictions affect rich and poor alike.

At current consumption levels this view does not appear to be supported by the data, which suggests that household expenditure on water grows roughly in line with income. Nevertheless, at lower levels of consumption, water demand is probably inelastic.

Moreover, large increases in prices would involve transfers of wealth to owners of existing water infrastructure and water rights, without any necessity for additional investment. The problem, therefore, is to increase the price of water at the margin without greatly increasing total expenditure.

The preferred solution to this problem so far has involved increasing block tariffs, in which the cost of water increases. Although the idea is correct, there are some big problems with the way it has been implemented. One problem is that the use of three or more blocks adds complexity, and potential inequity, but does not really improve the incentives generated by the pricing scheme relative to a two-price system.

A more important criticism is that the increasing block system discriminates against large households. Even without wasting water, a large household can easily find itself paying high prices.

There is a relatively simple way of resolving both problems. Instead of applying a multipart tariff to households, water could be supplied at a uniform price, equal to marginal cost of around $1.50 per kL. In place of a free or low cost initial block allocation to households, every person in the community could be given a free allocation of water, sufficient to meet basic needs for drinking, bathing, washing and so on. An allowance of 100 litres a week or around 50 kLs per year could be considered.

Such a scheme would raise some practical difficulties. It might also be inconsistent with the COAG approach to water pricing, which seeks to impose a cost-reflective connection charge. However, given that connection to the water supply is effectively compulsory, such a requirement makes little economic sense.

Even if a personal water allowance proves infeasible, any increase in usage charges should be balanced by a reduction in access charges. Since these charges are the same for all households, regardless of income, they are, in general more regressive than access charges.

The water crisis is a political problem and requires a political solution. A pricing scheme that recognises the special status of water as a basic human need while ensuring that effective prices are in line with economic and social costs seems like a natural solution.

5. Rural–urban trade

Current policy regarding rural and urban water use displays a range of inconsistencies. There are well-developed markets for temporary transfers of water between irrigators in most catchments, but permanent transfers and transfers between catchments are subject to various limitations, and transfers of water from irrigation to other uses outside a given catchment are prohibited in many cases.

It is, therefore, worth considering some of the arguments for and against allowing or encouraging trade in water between urban and irrigation uses. The central argument for trade between irrigation and residential water use is one of economic efficiency. This argument is most commonly put in terms of efficiency in consumption. In the absence of external effects on other parties, voluntary trade must improve the welfare of both buyers and sellers.

A more powerful version of the same argument may be presented in terms of production efficiency, with a focus on technological possibilities for water consumption. Consider the situation of an irrigation user who can implement measures to reduce losses of water through leakage or waste, at a cost of $150 for each megalitre (ML) saved. With annual allocations of irrigation water commonly trading at around $100 per ML in non-drought

Key points

- Although water restrictions are an appropriate short-run response to unexpected supply shortages, only price adjustments can match supply and demand in the long run.
- Trade between irrigation, urban and environmental water use should be enhanced, and will not entail substantial contraction of the value of output from irrigated agriculture.
- A policy based on markets for irrigation water and quantitative controls for urban water is inconsistent and ultimately unsustainable.

years, there is currently little incentive to pursue such options. The result is that less cost-effective water-saving options may be adopted in urban areas, where the price of water is around $1 per kL ($1000 per ML).

Arguments against trade between irrigation and residential water use can be grouped into two main categories. These are general arguments against allowing trade between catchments, and specific arguments against allowing urban water suppliers and users to trade with irrigation users.

Arguments against allowing trade between catchments commonly involve some form of "asset stranding", in which existing irrigation infrastructure cannot earn an adequate rate of return because of the transfer of water rights. The issue of asset stranding is complex, but it is important to recognise that it is mainly a matter of adjustment costs (Freebairn & Quiggin 2005). Hence, the appropriate response is to mitigate those costs rather than to prohibit trade altogether.

Critics of trade between urban and irrigation users are concerned, on the one hand, with the loss of productive capacity in agriculture and, on the other, with the perceived wastefulness of some forms of urban water use. A useful way to think about this issue is to mentally substitute "land" for "water". Cities have always grown by converting farmland to residential use. Concern about the resulting loss of productive capacity was a hot topic in the United States a decade or so ago, but the issue has never gained much traction in Australia.

There are good urban planning reasons for keeping green space, including farms, but few would support a total ban on the conversion of agricultural land to residential use, or a policy that required cities to accommodate all future population growth within their existing boundaries.

Under current conditions trade in water between irrigation and urban use is likely to remain relatively limited. Urban use accounts for about 25 per cent of total water use in Australia. Assuming that 20 per cent of total urban water demand was met by transfers from irrigation, the amount transferred would be about 5 per cent of total water use, or a little over 6 per cent of existing use in irrigation. The volume involved would be around 750 gigalitres (GL) each year. This is small in relation to total use in irrigation, but could make a significant difference to the availability of urban water. Given improved allocation of water within the irrigation sector, it would be possible to release water for urban use while maintaining or even enhancing the value added in irrigated agriculture.

6. Environmental flows

The development of large-scale irrigation has had a number of generally adverse effects on the pattern of water flows available to natural environments. Most obviously, the average flow has decreased as a result of large-scale extractions. The annual variance of flows has decreased, since releases from storage allow flows in years when natural inflows are very low and the system no longer experiences very high flows.

The seasonal pattern of flows has also changed. The natural pattern was one of high flows in spring, caused by the melting of snowpacks in the Snowy Mountains, followed by low flows in summer and autumn. Management of the river has produced a more even seasonal pattern with peak flows in summer when demand for irrigation water is highest.

Finally, the quality of water has changed in a number of respects. Storages in the upper catchment experience stratification during summer and autumn. In summer, water at temperatures of less than 10°C is released into rivers when natural temperatures would have been in the order of 16–20°C.

Thus plant and animal species experience flow conditions that are radically different from those for which they evolved. Species finely adapted to particular ecological niches are likely to suffer disproportionately while more robust species, including introduced animals and plants, may benefit.

The need for enhanced environmental flows has been recognised by policymakers. The Living Murray initiative (Murray–Darling Basin Commission 2003) identified six significant ecological assets:

- Barmah–Millewa Forest
- Gunbower and Koondrook–Perricoota Forests
- Hattah Lakes
- Chowilla Floodplain (including Lindsay-Wallpolla)
- Lower Lakes, Coorong and Murray Mouth
- the River Murray Channel.

A scientific study commissioned to assess options for restoring 500, 1000 or 1500 GL of annual flows to the environment (compared to median natural flows of around 10 000 GL) came to the conclusion that 1500 GL was the minimum amount needed. However, under the National Water Initiative, a commitment was made to achieve additional environmental flows averaging only 500 GL a year. Thus far, only modest progress has been made towards this goal, and the problem has been further complicated by the drought.

The main obstacle to the fulfilment of the environmental flows commitment has been the unwillingness of state and federal governments (with the exception of the SA government) to undertake direct repurchase of water rights from irrigators. Instead, the main focus has been on engineering schemes aimed at increasing the efficiency of water use. Unfortunately, many proposed schemes have a low benefit–cost ratio.

More recently, the Commonwealth government announced that it will purchase water released as a result of on-farm efficiency improvements. While this may be regarded as a step forward, the limitations only point out the inefficient and arbitrary nature of the policy. Consider a rice farmer, for whom returns are not sufficient to justify the current cost of water required for flood irrigation. If the farmer spends substantial resources on new irrigation systems to reduce water use, the government will purchase the water saved as a result. On the other hand, if the farmer decides to grow dryland wheat instead of irrigated rice, the policy precludes the purchase of the water saved.

One possible way of resolving some of the problems associated with repurchase of irrigation rates would be to defer the date at which the purchase takes effect. Quiggin (2006) observes that a range of transitional arrangements for water rights will expire in around ten years and argues that farmers might be willing to accept payments now in return for agreeing that water rights should revert to public ownership at that time. The availability of a lengthy period for planning and implementing reduced reliance on irrigation water would reduce the costs of adjustment.

Conclusion

Water policy in Australia presents a range of challenges from short-term crises associated with the current drought to a long-term mismatch between demand and supply that can only be resolved by an increase in prices. In addition, it is necessary to improve our understanding of the variable and changing climate that determines the ultimate limits on the availability of water.

Responding to these challenges requires an appreciation of both the strengths and limitations of market-based policies. A policy based on markets for irrigation water and quantitative controls for urban water is inconsistent and ultimately unsustainable.

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“Unfortunately, many proposed schemes have a low benefit–cost ratio.”

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