
OVERVIEW

Key points

- The Australian Government has an ambitious agenda for increasing the availability of water for the environment in the Murray-Darling Basin: water will be reallocated administratively through a Basin Plan; and water will be recovered through a ten-year \$3.1 billion buyback of water entitlements, and a \$5.8 billion investment in water saving infrastructure.
- The 2011 Basin Plan will ultimately allocate water between consumptive and environmental uses, in each catchment. The buyback aims to assist irrigators to adjust to the much lower diversion limits that are likely under the Basin Plan and to regain some water for the environment in the interim. The infrastructure program shares these broad objectives but also aims to help sustain irrigation communities.
- The buyback is occurring before sustainable diversion limits (SDLs) are set under the Basin Plan, and before the liability for policy-induced changes to water availability has been resolved. This is creating uncertainty in the minds of irrigators and affecting the efficiency of the buyback.
- SDLs must be based on scientific assessments of the amount of water that is required to avoid compromising key environmental assets and processes. Good science is a necessary but not sufficient basis for optimising the use of the Basin's water resources. The value people place on environmental outcomes, the opportunity cost of foregone irrigation, and the role of other inputs, such as land management, must also be considered. If the Water Act 2007 (Cwlth) precludes this approach, it should be amended.
- The same cost effectiveness tests should be applied to all water recovery options. Purchasing water from willing sellers (at appropriate prices) is a cost-effective way of meeting the Government's liability for policy-induced changes in water availability. Subsidising infrastructure is rarely cost effective in obtaining water for the environment, nor is it likely to be the best way of sustaining irrigation communities.
- Other water products (for example, seasonal allocations and options contracts) are potentially valuable in meeting short-term environmental needs.
- Tenders are sound purchasing mechanisms where active markets for water entitlements do not exist. But where active markets do exist, acquiring water directly from those markets is likely to be more efficient.
- The 4 per cent limit on out-of-area trade of water entitlements should be eliminated as soon as possible. Limits on the amount of entitlements that can be sold to the Commonwealth through the buyback should also be eliminated.
- Using the buyback to achieve distributional goals, system rationalisation or to manage salinity is likely to compromise its efficiency and effectiveness. Other more direct instruments should be used to address these issues.
- Governance arrangements for the recovery and management of water for the environment are fragmented. Greater coordination of water recovery and environmental watering by Basin jurisdictions is required.

Overview

Water shortages in the Murray-Darling Basin are placing considerable stress on many environmental assets in the Basin. From the 1950s to the 1990s, the share of available surface and groundwater diverted for consumptive uses, such as irrigation and domestic use, increased, leaving less water for the environment, even in normal conditions. A decade-long drought has further limited the amount available for the environment, and climate change is expected to exacerbate these problems in the future.

There is widespread recognition that some of the Basin's water resources need to be redirected to the environment. But questions remain about how much water should be recovered and from where, how it should be recovered, and how it should be used to achieve the best outcomes for the Australian community.

There are three main ways governments can recover water for the environment: purchase it from those who hold the property rights to use it now; invest in more efficient delivery systems and redirect the water savings to the environment; and/or change the rules regarding the sharing of water between competing end uses. While this study is predominantly about market mechanisms for obtaining water, all of these methods are currently in use in the Basin and the interactions between them are complex.

Until recently, water was allocated to the environment through administrative plans, prepared and implemented by the states. Interstate coordination was dependent on cooperation and adherence to a Basin-wide cap. Weaknesses in this approach led the Basin jurisdictions (the Commonwealth, NSW, Victorian, Queensland, SA and ACT governments) to agree to a referral of powers to the Commonwealth to enable it to draw up a binding Basin Plan, due for completion by mid-2011 (box 1). Among other things, this Plan must set (long term average) sustainable diversion limits (SDLs) for each catchment within the Basin and for the Basin as a whole. The states' subsequent water resource plans will have to be consistent with the Basin Plan.

Box 1 The Basin Plan will reallocate water to the environment administratively

To help rationalise the allocation of water within the Murray-Darling Basin, the Murray-Darling Basin Authority (MDBA) is required to develop and implement a Basin Plan by 2011. It will set (long-term average) environmentally sustainable diversion limits (SDLs) on quantities of surface water and groundwater extraction and the conditions under which such diversions can occur. It is widely expected that SDLs will be much lower than the status quo, to allow a substantially higher proportion of whatever water is available to be allocated for meeting ecosystem requirements.

A key part of the Basin Plan will be an environmental watering plan that will set environmental objectives and targets for water-dependent ecosystems across the Basin. This will govern the allocation of both water held by the Commonwealth Environmental Water Holder (a statutory position created under the *Water Act 2007* (Cwlth) to manage the water entitlements that the Commonwealth is currently acquiring) and other planned environmental water provided for under the Basin Plan.

The Basin Plan will set requirements that must be met under new state water resource plans to be introduced in 2014 in all affected jurisdictions except Victoria, which is scheduled to introduce its next water plan in 2019. Based on advice from the MDBA, the Minister must accredit these plans, but only if satisfied they are consistent with the Basin Plan. While SDLs will start to have effect from 2014 onwards, 'temporary diversion provisions' can be introduced to provide a five-year transition period.

In the meantime, the Australian Government's water purchasing priorities have been guided by the findings of Basin-wide scientific studies on water availability and ecosystem health, information on the specific needs of particular environmental assets, and by the perceived difference between current levels of use and the anticipated SDLs, due to be published in draft form in 2010 and set in 2011.

Sources: DEWHA (2009b), MDBA (2009a).

For its part, the Australian Government has also embarked on a \$3.1 billion program of purchasing water entitlements from irrigators, called Restoring the Balance (RTB), and a \$5.8 billion program to upgrade irrigation infrastructure, called Sustainable Rural Water Use and Infrastructure (SRWUI).

The main feature of the RTB is a tender process (box 2). It commenced in 2007-08 and is scheduled to run until 2016-17. As at 31 January 2010, the Australian Government had purchased 797 gigalitres (GL) of entitlements of varying reliability, which is expected to deliver about 532 GL per annum on average (compared with Basin-wide, average inflows of over 10 000 GL per annum). As entitlements are purchased, they are passed across to a Commonwealth Environmental Water Holder (CEWH) for management. As at the end of

January 2010, the CEWH had allocated only 76 GL for environmental use in the Basin, partly because of low seasonal allocations.

Box 2 The Restoring the Balance tender process

The principal market mechanism used to date under Restoring the Balance is a sequential tender for water entitlements. The key features of this mechanism include:

- Repeated format — the tender is conducted over discrete rounds.
- Non-binding bids — the bids constitute non-binding expressions of interest by the potential water sellers. In the first three rounds, which were open for a considerable amount of time, fortnightly assessments of the bids received in the preceding two weeks were made. In the most recent round, a new format was adopted. The round was open for three weeks and bids were only assessed when it was closed.
- Reserve price — a benchmark market price is determined for each catchment and bids that are under that price are automatically accepted, and proceed to the due diligence process.
- Discriminatory price — successful participants in the tender are paid the price that they bid, rather than a uniform market clearing price.
- Sealed bids — the bids are not revealed to the market during or after the tender.

The design of the Restoring the Balance tender is similar to most past and current environmental water recovery tenders undertaken in Australia.

The scale and complexity of these initiatives are unprecedented in Australia, and although many other countries are facing similar dilemmas, there seem to be very few close parallels anywhere else in the world. However, while Australia is widely regarded as a world leader in moving to the sustainable management of water resources, there appears to have been insufficient forethought given to the design, scale and implementation of these initiatives.

The Australian Government asked the Productivity Commission to report on market mechanisms for recovering water in the Basin for the environment, and ways in which it could diversify its current approach. The Commission's general conclusion is that purchasing water from willing sellers at appropriate prices is a sound approach to meeting the Australian Government's commitment to obtain additional water for the environment. While the Commission has some suggestions on how the buyback could be improved, it considers that greater gains can be achieved by clarifying objectives, as well as further considering the merits of the different means by which water is being recovered and the links between them.

The Australian Government's objectives

To assess the effectiveness of these water recovery initiatives, it is first necessary to clarify what they were meant to achieve.

Drawing on the *Water Act 2007 (Cwlth)* the objective of setting SDLs within a Basin Plan can be summed up as restoring the management of the water resources in the Basin to a sustainable basis. It is an attempt to, among other things, '... set and enforce environmentally sustainable limits on the quantities of surface water and groundwater that may be taken from Basin water resources' (MDBA 2009a). And it takes a Basin-wide perspective.

The objectives of the RTB and the SRWUI programs can be gleaned from various statements made by the Australian Government and COAG:

- The RTB buyback has two objectives: to obtain entitlements to 'soften the blow' to irrigators of making the transition from current levels of diversion to the much lower SDLs anticipated under the Basin Plan; and to obtain water for the environment to meet short-term urgent needs in the meantime.
- The SRWUI program has the same objective of easing the transition to the Basin Plan. And there is also some similarity in that it should be a cost effective way of obtaining water for the environment (though in this case, this might be only achievable in the medium to longer term). But eligible projects must also '... secure a long-term sustainable future for irrigation communities, in the context of climate change and reduced water availability in the future' (Agreement on Murray-Darling Basin Reform 2008). More recently, a food security objective has also been used to justify this program.
- Both programs are required to provide value for money in recovering water.

The fact that the buyback and infrastructure programs have two objectives that are the same or similar — to ease irrigators' transition to lower levels of water availability and to recover water for the environment before the Basin Plan takes effect — facilitates comparison between them. But this is then complicated by the infrastructure program having the additional objectives of 'sustaining irrigation communities' and 'food security'.

Attempting to achieve multiple objectives with one instrument may compromise effectiveness and efficiency. The Commission has considered the best ways of achieving each objective in turn. The potential for compromise is illustrated well by the RTB's focus on purchasing only entitlements, a strategy much more suited to achieving the transitional objective than it is to meeting short-term environmental needs.

The risk assignment provisions

Much of the current policy framework affecting the Basin is built on the National Water Initiative (NWI), an agreement between all jurisdictions signed in 2004. The NWI contains a set of risk assignment provisions that were intended to give entitlement holders greater certainty over who would bear the risks of future reductions in the quantity or reliability of allocations. These provide an important backdrop to this study that helps put the buyback and infrastructure programs in perspective. The Murray-Darling Basin Authority (MDBA 2009e) has summarised these provisions as meaning that:

... any reduction in size or reliability of a water allocation will be borne as follows:

- by water entitlement holders, if the reduction is the result of seasonal or long-term changes in climate, or of periodic natural events such as bushfires and drought
- by a government, if the reduction is the result of changes in that government's policy
- by water entitlement holders and governments (according to a specific formula), if the reduction results from improvements in knowledge about the environmentally sustainable level of take of water.

All Basin jurisdictions were to incorporate these (or equivalent) provisions in their own legislation. The Australian Government has incorporated them in the Water Act, and has stated that it will meet its responsibilities (as far as practical) for policy-induced changes in water availability by purchasing entitlements and investing in water-saving infrastructure. Furthermore, the MDBA is required to spell out what proportion of the proposed reductions in water availability in the Basin Plan will be the Commonwealth's responsibility.

Notwithstanding these developments, there is confusion over when and how these provisions will apply and where the assignment of risk will fall. For one thing, the provisions were meant to apply only after water resource plans prepared by the states had addressed 'overallocation' and/or 'overuse'. However, the National Water Commission (NWC) notes that there is no agreement among the jurisdictions on what 'overallocation' means, and very few water resource plans introduced since the NWI explicitly address overallocation. If not addressed already, 'overallocation' and/or 'overuse' will be effectively addressed when new (Basin Plan-compliant) water resource plans begin from 2014 onwards. But how corrections for past 'overallocation' or 'overuse' will be distinguished from policy-induced changes is unclear.

What is also unclear is the extent to which the buyback and infrastructure programs will collectively meet the Commonwealth's obligations. Such is the substantial expenditure earmarked for these programs, that there must be some risk the

Commonwealth will end up compensating irrigators for risks they or the states had agreed to bear under the NWI.

The Commission shares the concerns raised by the NWC that the risk assignment provisions and their application by all governments urgently need clarification, and that this needs to be communicated in clear, simple terms. As the NWC (2009b, p. 200) notes, this ‘... will help water access entitlement holders better understand all possible changes to the security and reliability of their entitlements, and to make planning and investment decisions with confidence.’ A clear distinction is required between those reductions in availability of water for consumptive use that are compensable — and which could be addressed through agreed water recovery measures including the buyback — and those to be made administratively without compensation.

The uncertainty surrounding these issues has implications for the efficient conduct of the buyback. Irrigators need to know if they should enter the buyback now, or risk the uncertain loss of an unspecified proportion of their water entitlements and/or less reliable seasonal allocations in the future.

Clarifying environmental watering priorities

Many environmental assets in the Basin need more water. Deciding which to water, when and with how much are questions that need to be addressed, not only in devising a sound watering plan but also in devising a sound purchasing plan that will maximise benefits to the Australian community.

The Basin Plan, and its subordinate water resource plans, will provide the framework for environmental watering in the medium to longer term. In the interim, the buyback has had to look elsewhere for guidance on which entitlements to purchase, and the CEWH has had to develop a separate watering plan.

In setting purchasing priorities, the Department of Environment, Water, Heritage and the Arts (DEWHA) has relied in large part on two existing Basin-wide scientific studies on water availability and ecosystem health (the CSIRO sustainable yields project and the MDBC Sustainable Rivers Audit), and other specific information where available. This may be a pragmatic approach, given information deficiencies, but because it does not address the ecological responses that might be achieved from watering different environmental assets, or the value the Australian community might place on those responses, it is an imperfect basis for setting watering, and hence purchasing, priorities.

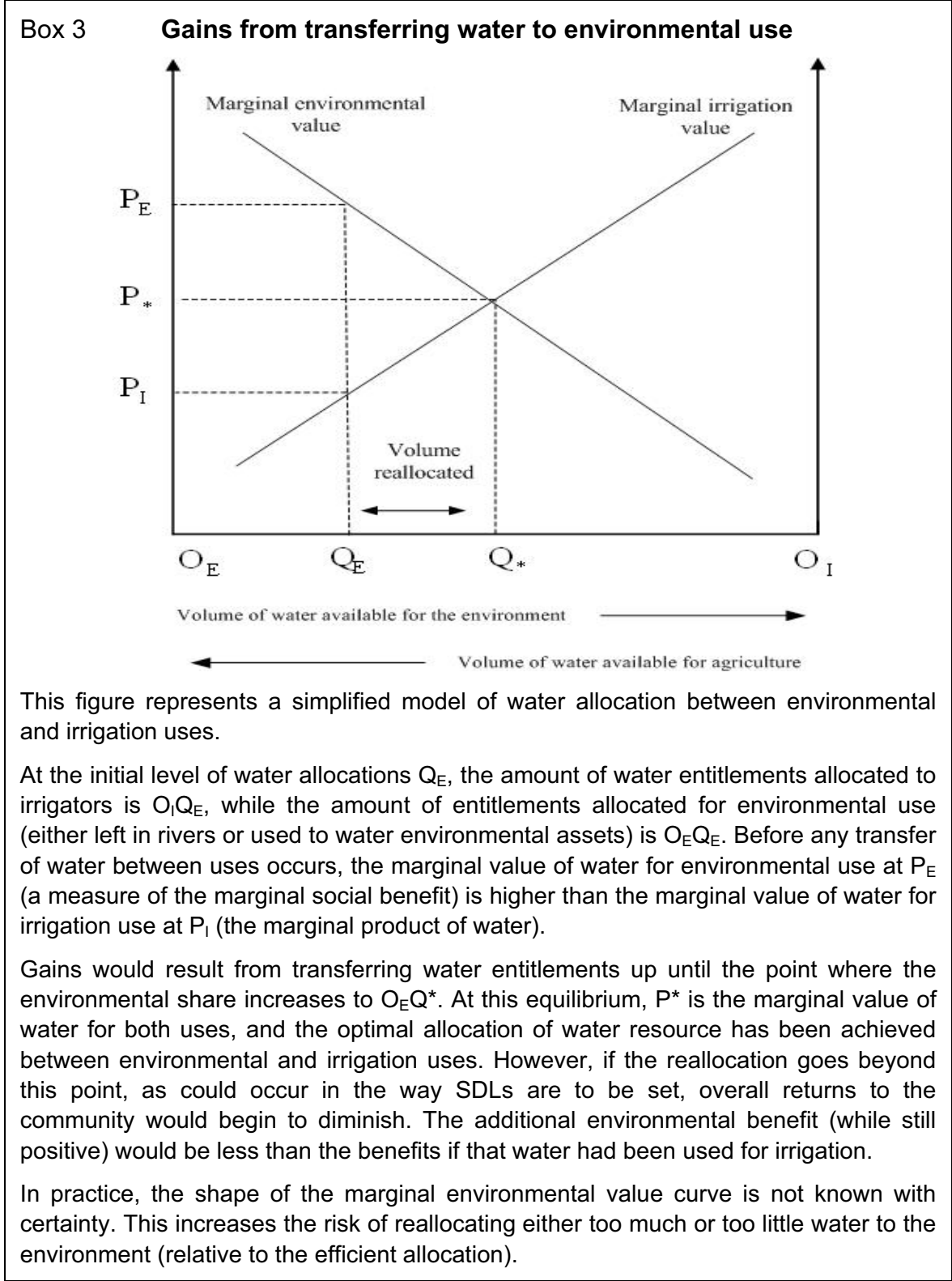
DEWHA has argued that it has been operating on a ‘no regrets’ basis in purchasing water, believing that the shortfalls in allocations to the environment in most catchments in the Basin were so substantial, that there was little risk of it buying too much, or the wrong water. But when consideration is given to the water already held by the CEWH and other environmental managers, and the quantities that stand to be recovered through the infrastructure program, a more cautious approach would now seem appropriate, at least until the Basin Plan is finalised. Indeed, there is potential for past and existing water recovery programs to recover average annual flows of more than 2500 GL. This is considerably more than was thought necessary to have a moderate chance of achieving a healthy river system only a few years ago.

The Basin Plan will ultimately provide much needed clarity through the determination of SDLs. But the Commission has some concerns about the way in which those SDLs are to be set, (and hence about using them to guide the RTB). According to the Water Act, they must be set using the best available scientific knowledge, and they must reflect an environmentally sustainable level of take. This is defined as the level of take that, if exceeded, would ‘compromise’ key environmental assets, ecosystem functions, environmental outcomes, or the productive base of the water resource. Interpretation of this statement is ambiguous. Avoiding ‘compromise’ would appear to establish a very high hurdle that could consign all other users to share whatever remains after meeting the environment’s needs, without regard to the opportunity costs. And as the MDBA acknowledges, decisions will need to be made about which parts of the environment or ecosystem are ‘key’ and which are not.

While good science is clearly important in setting the SDLs, so are the tradeoffs between consumptive uses and the environment — more water for the environment means less for irrigating crops or for domestic uses, and vice versa (box 3). Under the Water Act, the MDBA must advise on the expected socioeconomic consequences of setting SDLs. But the approach the MDBA is taking suggests this analysis might only influence how, when and where water is recovered, not how much. It appears that the MDBA has interpreted the Water Act to mean that it has little room for explicitly considering the opportunity costs of irrigation forgone in actually setting the Basin-wide SDL.

Further, while the Basin Plan is the vehicle by which better environmental outcomes are meant to be achieved, the only policy lever the MDBA has at its disposal is the allocation of water between the environment and consumptive uses. While recovering more water is in most cases a prerequisite for better environmental outcomes, other inputs, such as capital works to manage, control or re-direct environmental flows, and changes to land management practices, may also be required. Without consideration of these other inputs, the Basin Plan may need to

allocate more water for achieving desired environmental outcomes than is otherwise needed.



Getting the right balance between competing environmental assets, and between the environment and consumptive uses, requires knowledge of the relative values that the Australian community place on the various environmental, social and economic outcomes. This cannot be determined just on scientific grounds.

While some participants in this study have maintained that there is scope in the Water Act to achieve a balanced outcome, much relies on how the MDBA interprets the SDL provisions. A balanced outcome might be possible if ‘key’ assets are identified judiciously, and there is scope to water environmental assets at a less than ideal frequency (or water less of each), without ‘compromise’. But there is no process for explicitly assessing these tradeoffs, and hence these outcomes are far from assured.

This issue is crucial to the efficient conduct of the buyback and the SRWUI programs. Given the potential for the SDLs to be set at levels that would recover more water than is optimal from a community-wide perspective, the Australian Government may inadvertently pass the point of ‘no regrets’ in operating its water recovery programs.

The Commission is not arguing against the case for allocating more water for the environment. This is patently necessary to improve the health of the Basin’s environment. But the potential now exists for one misallocation of resources (too little water for the environment) to be replaced with another (higher than necessary social and economic cost). To the extent that there is scope to do so, the MDBA is encouraged to define SDLs in a way that has more explicit regard for the objects of the Water Act, which include that the Basin resources be managed in the public interest, and to optimise economic, social and environmental outcomes (ss. 3(a) and 3 (c)). If a strict legal interpretation of the SDL definition precludes this, the Water Act should be amended.

There is also a need for the MDBA to articulate how the trading of entitlements by the CEWH will affect SDLs. These limits need to be sufficiently flexible to allow the CEWH to trade in ways that make use of new information on how to improve environmental outcomes from watering. There is also a need to ensure that such trade does not affect the reliability of supply for unrelated third parties. Such third-party impacts could potentially arise because more or less entitlements would be sharing the same consumptive pool of water.

The Restoring the Balance program should not be used to achieve unrelated objectives

Many participants in this study want the RTB purchases targeted to certain locations to achieve other objectives including: ameliorating community adjustment pressures; managing the consequences of exiting irrigators leaving others to pay for the upkeep of the system (the ‘Swiss cheese’ effect); facilitating system rationalisation; and/or addressing irrigation-related externalities, such as salinity.

Targeting to address social and community issues

Some study participants favour government buybacks being geographically targeted to minimise, or at least soften, the impacts of the sale of entitlements on local communities. For example, it is sometimes suggested that buybacks should be concentrated in areas that are more resilient, perhaps due to a more prosperous and diversified local economy. These distributional arguments run counter to the intention of broader water reform, that aims to facilitate water being traded to its highest value use. Also, such targeting could be considered inequitable, because it would exclude willing sellers from non-targeted areas and, in any case, has the potential to be undone by post-buyback trade.

Any ‘Swiss cheese’ effects should be managed in other ways

Some irrigators wanting to remain in irrigated agriculture are concerned that the atomistic buybacks currently being pursued will produce a ‘Swiss cheese’ effect, with geographically-dispersed farms within a networked system moving out of irrigated agriculture. It is argued that this will leave fewer farmers from whom to recover the joint costs of water delivery. An alternative often proposed is to restrict the buyback to areas identified as having a low potential for continued irrigation, with a view to closing them down.

There would be some potential for atomistic buybacks to cause inefficiencies if they enabled irrigators to renege on existing commitments to contribute towards infrastructure-related capital costs. But irrigation infrastructure operators are able to levy termination fees that negate this potential. And not all who sell their entitlements surrender their delivery rights, preferring perhaps to continue irrigating using seasonal allocations, or to buy entitlements in the future. Furthermore, not all impacts will be negative, as the ‘holes’ created by a ‘Swiss cheese’ buyback may open up future opportunities for neighbouring farmers to diversify their operations.

Where the costs of servicing different irrigators varies considerably, implementation of more cost-reflective pricing and direct negotiations between irrigation infrastructure operators and irrigators, coupled with market pressures, should be the preferred approach. This would give the best chance of achieving the mix of system rationalisation and geographically-dispersed water sales that is efficient for each area.

Targeting the buyback to rationalise irrigation systems can create significant inefficiencies and inequities and should be avoided. Irrigators denied the opportunity of entering the buyback may be less efficient than those in targeted, low productivity areas, or face greater hardship. Equally, it does not follow that farmers in low productivity areas should have any *additional* pressure or incentive to exit.

Targeting water that causes environmental problems

Purchases could also be targeted to reduce environmental problems associated with irrigating in particular locations and/or in particular ways. Thus, water currently being used in areas known to produce highly saline return flows to rivers could be targeted. The Commission considers that a better approach would be to use regulations and/or pricing (for example, salinity credits) to achieve socially desirable patterns of water use. Again, targeted purchasing would be an ineffective ‘second best’ approach, unless rules were put in place to prevent water being traded back to the area after the buyback.

In the Commission’s view, the buyback should not be compromised by attempting to achieve such objectives. A neutral, independent buyback actually assists (rather than impedes) adjustment processes by giving irrigators the opportunity to sell some or all of their water, and restructure their businesses.

Investing in irrigation infrastructure to recover water for the environment needs reconsideration

Recovering water for the environment through infrastructure upgrades requires that governments be provided with some or all of the water savings in return for their funding. As such, they are effectively buying water, but with the requirement that the payment they provide be used to invest in irrigation infrastructure.

Infrastructure upgrades are generally not cost effective

The Commission has examined the experience of Australian programs for recovering water through subsidising infrastructure, and concluded that they are generally much less cost effective and efficient than buybacks. For example, infrastructure projects financed under the Living Murray Initiative recovered water at a cost almost 40 per cent greater than the cost of market-based measures. With water becoming increasingly scarce, irrigators and irrigation infrastructure operators have had strong incentives to invest in water-saving projects, meaning most of the ‘low hanging fruit’ has been picked already. Indeed, the indications are that projects being considered under the SRWUI program are likely to be less cost effective than projects funded during the Living Murray Initiative.

Subsidising irrigation infrastructure projects that do not provide benefits additional to those accruing to irrigators is a poor use of taxpayer funds, relative to buybacks. The case for subsidising a particular irrigation infrastructure project would be stronger where it provided external benefits. For example, reducing leakages from distribution systems can decrease waterlogging and land salinisation problems for unrelated third parties. But these projects can also decrease return flows that otherwise might benefit downstream users, or increase downstream salinity, hence the net impacts would need to be considered on a case-by-case basis.

Other drawbacks

Other drawbacks of subsidising irrigation infrastructure investment include that it:

- is inconsistent with the cost recovery principles agreed to by governments under the NWI
- can lead to ‘gold plating’ assets that may subsequently become stranded
- is inequitable for those who have already made such investments privately at full cost.

Many participants in this study have emphasised the flow-on benefits of infrastructure expenditure for the local community, and used regional multipliers to illustrate the aggregate impact. But because the same expenditure could have had a similar impact if spent elsewhere in the economy, regional multipliers are not reliable indicators of net benefits to the broader community. Nor do they reveal anything intrinsic about the productive use of the funds; the same or similar regional impacts might be achieved from spending the funds on other projects. Paying well above the market price for water obtained through infrastructure upgrades, as has

occurred through some past programs, imposes substantial costs elsewhere in the Australian community.

What about other objectives?

Other objectives attributed to the SRWUI program are that it helps sustain irrigation communities and enhances food security.

Subsidising irrigation investment may contribute to sustaining an irrigation community faced with declining access to irrigation water, but is only one, and probably a small, influence on rural communities. Drought and structural changes are much more significant influences. Any attempt to influence the future of regional communities would be better pursued through regional development policy that has regard for all of the drivers of change.

The potential for investing in worthwhile projects also needs to be considered. Some regions have already modernised their infrastructure so that there is little potential for using this policy instrument to achieve the desired objective. If investments do not meet basic cost-benefit criteria, they will just perpetuate a dependence on external support, delaying the adjustment these communities will inevitably have to face.

As to enhancing food security, the Commission notes that this objective sits uneasily beside Australia's status as a large exporter of food, and that it is difficult to see how it could be used as a guiding principle for investing in irrigation infrastructure.

The funds could be better used

Notwithstanding the Commission's concerns about the SRWUI program, it recognises that this program can be seen as the price the Australian Government was prepared to pay to make progress on important reforms, such as implementation of the Basin Plan and the buyback. The expenditure can also be seen as one way in which the Australian Government is meeting its obligations under the risk assignment provisions. Furthermore, some \$4.4 billion of the \$5.8 billion allocated to this program has been committed, subject to due diligence. But even so, there is scope to utilise better the remaining funds allocated (and possibly to claw back funds from projects currently being assessed) in the following way.

First, the Commission considers that projects implemented through the SRWUI program should be assessed by essentially the same criteria as those used for the

buyback. The most important of these are cost effectiveness, and the ability to obtain verifiable quantities of water that can be delivered to valued environmental assets (after taking into account any detrimental third-party effects). Rigorous project approval processes need to be applied, and projects should generally only be approved where the cost per megalitre for water entitlements recovered is similar to the market price. Premiums should only be paid where there are demonstrable additional benefits to the community beyond the private benefits to irrigators.

Second, consideration should be given to diverting some of the SRWUI program funds to the buyback of entitlements, or to purchasing water through other means (for example, to address urgent environmental needs). Diverting funds to the RTB would be conditional upon clarification of the extent of the Commonwealth's obligations to supply compensation under the risk assignment provisions.

Third, the use of any remaining funds should be considered in the context of cost effectively addressing the objective of sustaining rural communities (to the extent this is necessary), or redirected to other government priorities that are more likely to achieve net benefits. It does not follow that investment in irrigation infrastructure is the only way of achieving regional development objectives. Investment in other forms of social and economic infrastructure may be more appropriate.

Matching instruments to objectives

The Commission has interpreted the Government's objectives in conducting the RTB to be twofold: to ease the transition to the lower levels of water allocated to consumptive use that are likely under the Basin Plan, and to provide some (urgently needed) water for the environment in the interim. Yet the Government is relying on a single instrument — purchase of entitlements — to achieve these goals simultaneously.

Addressing the transitional objective

While a focus on purchasing entitlements is a sound way of addressing this objective, there are different ways the Government could have gone about implementing its strategy. If the objective was purely and simply to aid the transition to the lower SDLs, the most appropriate method would have been to wait until the Basin Plan had been finalised, identify how much of the balance between current levels of entitlements and the SDL the buyback was going to acquire, and then commence its purchase program. This would have given the market clear signals and allowed a more efficient buyback.

But the Government chose to commence the rebalancing sooner rather than later and to provide immediate environmental benefits. The importance the Government places on the short-term needs of the environment may be illustrated by how much it has accelerated the buyback, bringing forward the planned expenditure to such an extent that approximately two-thirds of it will have been used before the Basin Plan is finalised. But despite this, the CEWH has so far only been able to provide some 76 GL for environmental watering to date, a very small amount given the alleged imbalances in the Basin and the stated urgency of addressing environmental needs. This illustrates the conflict between trying to address the short-term and long-term goals with the one instrument.

Addressing the needs of the environment

In terms of obtaining water for the environment, as and when it is needed, a broader portfolio approach is likely to be more efficient and effective than just relying on entitlements. In the short term, it would have also allowed the Commonwealth to address urgent environmental needs much more cost effectively. In the longer term, the CEWH will be able to trade entitlements accumulated through the buyback and use the proceeds to purchase a range of products, but in the short term has eschewed this option.

There are good reasons for the CEWH holding entitlements, but other products should also be considered (table 1). Entitlements give some assurance over future water deliveries (including through carrying over water), and by purchasing a mix of entitlement types, the CEWH will have some ability to match the flow regimes required for particular environmental assets. But this focus compromises the ability to meet short-term environmental needs. In the longer term, incorporating other products — seasonal allocations, options contracts, leases, purchasing changes to licence conditions and contracts to deliver specified environmental outcomes — could also improve the CEWH's flexibility in managing the changing needs of the environment.

Purchasing seasonal allocations would give additional flexibility in targeting environmental demands within and across seasons. Seasonal allocations could be used to fine-tune the flow regime needed for a particular environmental asset, which might not otherwise be possible with the portfolio of entitlements held. The alternative of purchasing entitlements and engaging in subsequent trade in seasonal allocations under those entitlements, will have greater transaction costs than simply acquiring allocations if and when required.

Table 1 Application of water products in a portfolio to meet environmental watering needs

<i>Product</i>	<i>Effectiveness</i>	<i>Efficiency</i>	<i>Most appropriate application</i>
Entitlements	Medium	Medium	Addressing constant known watering needs; using water in storage to address emergency needs and watering demands outside of irrigation seasons. Less efficient than seasonal allocations in addressing short-term needs.
Leases on entitlements	Medium	Medium	Addressing less certain environmental demands; replacing entitlements when there are administrative constraints on trade in entitlements.
Seasonal allocations	Medium-High	High	In the short term, addressing current urgent environmental needs, in the longer term addressing variable, uncertain environmental demands during the irrigation season.
Options contracts	Medium-High (long term)	Medium-High (long term)	As water markets develop in the longer term, replacing some of the entitlements and leases in the portfolio.
Covenants	Low	Low	In regulated systems (but rules-based approaches of options contracts might be more appropriate).
Changes to unregulated licences	Low-Medium	Low	To achieve shepherding of water through unregulated systems (might need to be implemented in conjunction with states).
Bundles of land and water rights	Medium	Low	When the same objectives could not be achieved through changes to unregulated entitlements or environmental services contracts (needs to be implemented in conjunction with states).
Environmental services contracts	Medium-High	Medium-High	Environmental assets on private land.

Irrigators have expressed concern about the Commonwealth entering this market as well. But the two markets are inextricably linked, and the impact on the prices of seasonal allocations will largely depend on how much water the Commonwealth needs in any one season, irrespective of whether it holds that water in the form of entitlements or seasonal allocations.

Options contracts would allow the Australian Government to purchase a right to take delivery of water under conditions specified in the contract (for example, to top up natural flows to achieve a flood), thereby also providing some flexibility. They have some advantages over purchasing entitlements by allowing the water to remain

in the hands of irrigators until required. But there would appear to be little advantage in going down this path until future environmental demands are known with more certainty under the Basin Plan.

Leases could provide some short-term flexibility where budgets are constrained and could potentially allow the parties to circumvent some legal and administrative constraints on entitlement trade. But over the longer term, the transaction costs are likely to be higher than holding the equivalent amount of water as entitlements.

In many unregulated catchments (where entitlements are rules-based and not backed by storages), purchasing upstream entitlements can be futile if downstream irrigators have rights to capture passing flows. In these circumstances, environmental managers may need to negotiate with a group of irrigators to change their licence conditions (such as minimum pumping thresholds) in ways that would enable the environmental water to be shepherded to environmental assets.

Purchasing environmental outcomes may also have a niche role to play in managing water resources in the Basin, particularly where key environmental assets are on private land (for example, the Macquarie Marshes and Gwydir wetlands). This approach recognises water is an input to achieving desirable environmental outcomes and may need to be combined with other inputs, such as control of weeds and feral animals, and engineering works. But there can be problems in measuring performance and monitoring compliance.

Purchasing instruments other than entitlements might not make quite the same progress in achieving the Government's longer term adjustment objectives, but it would significantly enhance the cost effectiveness of achieving short-term environmental objectives. A given amount of expenditure will go much further in purchasing seasonal allocations or leases, for example, than entitlements. And there is little point in acquiring entitlements to provide ample water in the future if environmental assets are seriously degraded in the short term.

Matching instruments to objectives would suggest that the most appropriate approach would have been to use seasonal allocations (and other instruments) to meet short-term needs (as some state governments have done), and then bring entitlements into the mix once the Basin Plan is set. It is not too late to adopt this approach.

The buyback could be improved

On-market purchases should be considered

Different market mechanisms can be used to purchase the various water products discussed above, but the options can depend on the existence of markets, and in some cases some mechanisms would be inappropriate. For example, tenders might be used to purchase entitlements, leases, options contracts and environmental outcomes, but may be too cumbersome for purchasing seasonal allocations.

Where active water markets exist, on-market purchases are likely to involve lower overall transaction costs, and be less disruptive to existing trading systems than the purchase of entitlements through a tender.

DEWHA has expressed reluctance to purchase entitlements in this way, citing three main reasons: the incomplete coverage of some exchanges; the absence of a standard contract; and the typically short period of time buyers are given to sign contracts. It argues that these contractual issues could make it difficult to undertake due diligence, and comply with other features of the Commonwealth Procurement Guidelines.

But these problems do not appear to be substantial. The limited coverage of some exchanges does not negate the possibility of making opportunistic purchases as and when suitable parcels of water come onto the market, besides which, the Commonwealth need not just operate through market intermediaries. Standing in the market and negotiating with irrigators is also a possibility. And it should be possible to both use a contract of its own design, and to exchange contracts promptly while making them conditional on clear title being demonstrated, to remove much of the risk to the Commonwealth.

The tender process could be improved

During the course of this study, DEWHA has changed the way it conducts its tenders. By far the largest tender to date ran for some nine months using a rolling tender design. Because irrigators could bid repeatedly, and information was shared informally within the market, price discovery occurred very quickly during this round, seemingly negating a key reason for choosing tenders over other market mechanisms. For the balance of the financial year 2009-10, DEWHA has chosen to run short sharp tenders each of three weeks duration, the first of which was limited to \$90 million, the second to \$120 million. Another key change is that bidders cannot submit bids that in total exceed their holding of entitlements (though they

could, for example, put in two bids each of fifty per cent of their entitlements but at different prices).

Whether these changes represent a permanent shift in the way DEWHA intends to conduct the rest of the RTB tenders is unclear, but they are an improvement on previous rounds. The shorter duration, and different rules on tendering, should lead to speedier resolution of bids, and reduce the potential for gaming.

The Commission considers further improvements could be made. Even with the shorter tender period, the approach that DEWHA uses for settling contracts is unnecessarily drawn out. Some of the delays are due to state agencies approving trades, but some are also attributable to internal (DEWHA) delays in processing bids. Participants have expressed frustration with delays in the due diligence process and have also indicated that it may be duplicating some existing state processes. Exchanging conditional contracts of sale before the due diligence process commences would help create more certainty for irrigators.

Many participants in this study have been concerned about the asymmetry of information in the market place. Markets work best where all participants have access to robust information, other things being the same. Where a large new buyer enters the market (as has been the case with DEWHA under the RTB program) it can create uncertainty about the future price of water, particularly if other market participants have no information on the new level of demand for water.

As part of the tender, DEWHA does not publish its price benchmarks, but it also gives little indication of how much it is seeking to purchase. The recent tenders reveal the aggregate budget, the information on the catchments where DEWHA will be accepting bids, and the types of entitlements it is seeking. This information is still at a very broad level and gives potential bidders very little idea about how much is being sought in particular catchments. This can have detrimental impacts on bidder behaviour and distort the participation in the tender. It can also impact private trade in the water markets and create uncertainty for irrigators making decisions on future business investment.

DEWHA considers that it would not be appropriate to publish the targets it is using for conducting the tenders. Its reasons are that doing so would tend to pre-empt the development of SDLs (and the environmental watering plan) under the Basin Plan, and that the targets are being continually refined. A further reason for not publishing these targets would be that it might encourage collusion between bidders where the number of entitlement holders that could meet the target in a particular catchment is small.

The benefits to potential bidders of DEWHA publishing its targets are likely to be modest, given that the largest sources of institutional uncertainty in the market are what impact the Basin Plan will have on the availability of water, and hence its price, and the application of the risk assignment provisions. Some clarity will be achieved once the proposed Basin Plan is published and draft SDLs are released (and the extent of the government's obligations are explained). But even then, this might not easily translate into specific targets at the catchment level (where for example the SDL was expressed as a formula). So some uncertainty will still remain even after the Basin Plan is finalised in 2011.

While the case for publishing specific targets is relatively weak, there would be value in DEWHA at least articulating how it intends to adapt its purchasing strategy to approach the SDLs. This should include whether it intends to approach them proportionately, the types of entitlements it would be seeking, and how it might interpret any formulas the MDBA might apply to setting SDLs. It should also articulate how the quantities it will be seeking are affected by anticipated water recovery under other programs, including the SRWUI program.

Governance is a challenging issue

The buyback is occurring within a complex set of institutional arrangements involving all Basin jurisdictions. But the governance arrangements for the recovery and use of water for the environment are still unclear. While the MDBA (and the Commonwealth Minister) have been given unprecedented authority to develop a Basin-wide approach to water management, the only policy lever of any substance it has at its disposal is the allocation of water between consumptive and environmental use. In most respects, the Commonwealth is dependent on the states (and private managers of environmental assets) to achieve the environmental outcomes that it aspires to, including through adopting appropriate land management practices, and investing in complementary environmental infrastructure.

While the Basin Plan should result in the states implementing compliant state water plans, and the CEWH will be required to manage his/her water in accordance with those plans, there are still some grey areas. In particular, it is unclear how the CEWH will coordinate his/her water with the inputs of local managers (including private managers) and other holders of environmental water. Given that most of the knowledge on how to best manage environmental assets exists at the local level, the Commission supports contractual arrangements between the CEWH and local managers, where those managers are competent to manage the water, and have clear accountability for achieving environmental outcomes. There would also be benefits

in providing better information summarising the existing provisions for environmental water in each catchment, and clarifying how RTB purchases take into account environmental water recovered under the SRWUI program, and environmental water provisions in state water sharing plans.

Overcoming impediments to the buyback

There are several impediments to the operation of markets for water that hamper a government's ability to recover water for the environment through the market.

While rural water markets in Australia are relatively well developed, many of the reforms called for under the NWI have stalled or are proceeding only slowly. For example, there are still substantial institutional differences between the states in the way entitlements are defined and traded, and in some areas water entitlements are yet to be unbundled from land. The Commission shares the concerns of the NWC about the slow progress in implementing these reforms and generally endorses its findings and recommendations with respect to Basin-related issues (NWC 2009b).

At a more specific level, the continued application of the 4 per cent annual cap on trade of entitlements out of an irrigation district has been seriously distorting irrigator-to-irrigator trade, the buyback, and structural adjustment. It is also a source of inequity between irrigators, and creates hardship for those caught by the cap and whose only real option is to capitalise their entitlements. Although permitted under the NWI, this limit has become a particular issue in Victoria.

The negotiated settlement between the Commonwealth and Victorian governments to allow exemptions for sales to the Commonwealth from selected areas is a step in the right direction, but the cap still constitutes a significant impediment. Attempting to micro-engineer the buyback to target particular areas is likely to be inefficient and inequitable. In the Commission's view, all states should eliminate this constraint from their policy framework as soon as possible.

Similarly, the agreement between the Commonwealth and NSW Governments to constrain the sale of NSW-based entitlements to the Commonwealth (made in exchange for lifting an embargo placed on all sales of water entitlements to the Commonwealth), unnecessarily constrains the buyback. It is reportedly leading to distortions in the market as irrigators rush to get their bids in. It too should be removed.

The ability to carry over water from one season to the next is a relatively recent practice in managing rural water resources in Australia, enhancing the ability of irrigators to meet variable demands. It will also be useful to environmental

managers holding entitlements. The amount that can be carried over is limited for good reason, as it can have undesirable third-party effects. But it is not clear that the current limits are optimal. These limits should be reviewed, particularly to ascertain whether there would be net gains from wider adoption of arrangements, such as capacity sharing and ‘spillable water accounts’, that give entitlement holders an improved ability to carry over water.

But perhaps the most serious impediment to achieving a good outcome for the community is that, despite the best intentions of Basin jurisdictions in developing a coherent approach to water policy under the NWI (and the subsequent Murray-Darling Basin Agreement 2008), policy implementation is still somewhat fragmented. State governments still have to rein in overallocation and over extraction of water resources in the Basin, and all jurisdictions (the Commonwealth included) need to articulate better how they intend to address their obligations under an agreed framework for assigning liability for reductions in water availability. Adding to the uncertainty is that the Basin Plan will not be finalised until mid-2011.

An overall assessment

While the NWI established a blueprint for the management of Australia’s water resources, the design, scale, implementation and sequencing of policy initiatives to recover and manage water for the environment in the Basin have not been ideal.

In the Commission’s view, the objectives for recovering water should have been clarified before deciding on how and where water would be recovered. Under this approach, the buyback of entitlements — as a means of transitioning to the lower levels of water availability under the Basin Plan — should have commenced only after the Plan had been ratified (and the assignment of risk between irrigators and governments clarified). Urgent short-term needs could have been addressed through the purchase of seasonal allocations. And to the extent that they provide net benefits to local communities, investment in new irrigation infrastructure should have come after the buyback had given some indication of where the more viable areas were likely to be. Above all, sound cost-benefit analysis should have preceded intervention.

It is not possible to wind back the clock, but there is still much that Basin jurisdictions could do to provide greater institutional certainty for the recovery and management of water for the environment in the Basin. Using market mechanisms for recovering water for the environment is a sound approach. However, the buyback needs to operate within a coordinated institutional framework, which has been lacking to date. Greater care is also needed to ensure that the very substantial

resources committed to the Basin produce the highest net returns for the taxpayer funds expended. As the measures are currently conceived and sequenced, the Commission fears that the benefits will not justify the substantial public expenditure and the socioeconomic dislocations imposed.