

This version: 17 March, 2006

Water reform in Australia: strengths and limitations of market-based mechanisms

Submission to the Productivity Commission research study, Rural Water Use and the Environment: The Role of Market Mechanisms.

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Summary

Salinity and related problems of land and water management constitute one of the biggest environmental problems facing Australia. Economic costs associated with salinity may be as much as \$350 million per year when foregone opportunities in agriculture are taken into account.

It is widely accepted that market-based instruments must play a central role in policy. Unfortunately, the formulation of irrigation policy is radically constrained by the refusal of most governments to accept the need for the most basic of market-based environmental policy instruments, namely, repurchase of water rights from irrigators where this is needed to meet environmental objectives.

Failure to consider repurchase except as a last resort has a number of adverse consequences. These include foregoing on-farm efficiency options, absence of a cost-efficiency benchmark and loss of policy discipline. An assessment of the Wimmera pipeline scheme suggests that the failure to consider repurchase is seriously reducing the cost-effectiveness of measures implemented under the National Water Initiative to address salinity and related problems.

Water reform in Australia: strengths and limitations of market-based mechanisms

Salinity and related problems of land and water management constitute one of the biggest environmental problems facing Australia. The severity of the problem, and the need for urgent action, have long been recognised. Moreover, it is widely accepted that market-based instruments must play a central role in policy.

In considering the use of market-based instruments, it is important to avoid the dangers of a naive enthusiasm for markets, and to maintain awareness of the implications of the term 'instruments'. Market-based instruments have substantial potential benefits, but the markets created in the process are nevertheless instruments of governance, and must be analysed in that light.

Unfortunately, the process of governance is not working well at present. The formulation of irrigation policy is radically constrained by the refusal of most governments to accept the need for the most basic of market-based environmental policy instruments, namely, repurchase of water rights from irrigators where this is needed to meet environmental objectives. This submission addresses the extent of salinity, its economic costs and the need for a policy response unconstrained by prohibitions repurchase of irrigation water.

Effectiveness of policy response

The National Water Initiative (NWI) is an important policy response to the past failures of water management in Australia, which have contributed to the emergence of a wide range of problems including rising salinity levels.

The NWI has a number of positive features. The financial commitment from governments is substantial and broadly appropriate to the scale of the problem. The general policy principles for water pricing, water rights and the allocation of water risk are broadly appropriate. These include a commitment to greater use of market-based instruments to manage the environment. Most importantly, the basic principle of the need for sustainable management has

been recognised.

The NWI allows for some reductions in existing excessive allocations of water. However, it is clear that such reductions will not be sufficient to meet the needs for water flows identified by the Living Murray Initiative as a response to salinity and other environmental problems.

The case for repurchase

The effectiveness of the NWI has been hampered by one critically important constraint on public policy, which undercuts the whole idea of a market-based policy. Governments have been unwilling to undertake the repurchase of water rights from users, especially irrigators, except as a last resort. Instead, any reduction in aggregate allocations below that implied by the COAG principles is expected to be achieved purely through technical measures to increase the efficiency of water use.

This position is widely endorsed by politicians in a number of political parties. For example, the Parliamentary secretary to The Prime Minister, Gary Nairn, has stated:

Proposals to transfer water from one catchment to another should only be pursued when all other viable alternatives have been exhausted

State Labor governments have adopted a similar position. The Bracks government in Victoria strongly opposes transfers of water from irrigation users to urban users and has shown little enthusiasm for the repurchase of water to meet environmental goals.

In NSW, the picture is much the same. In announcing proposals to allocate \$30 million from the sale of Snowy Hydro to improve the health of the Snowy River, the Snowy, the Special Minister of State, John Della Bosca, stated that the funds will be invested in water savings initiatives and will not be used to buy water rights from irrigators, nor will they move to reduce the water available to irrigators.

Similarly, the Victorian National Party policy states

If there is a demonstrable deterioration in river health requiring the allocation of a greater share of available water to the environment, the Government's options for recovery of additional water should be limited to investments to improve the efficiency of the water distribution system, incentives to encourage water use efficiency and, **as an absolute last resort**, purchases of water (emphasis added).

The only jurisdiction in the Murray-Darling Basin to show significant interest in the repurchase option has been South Australia. This is not surprising, since South Australia suffers most severely from salinity and other problems and has exhausted most of the options for efficiency improvement.

The picture in Western Australia is unclear. Some repurchase has taken place, but there still appears to be reluctance to pursue this option in many cases where it would clearly be cost-effective.

The unwillingness or extreme reluctance of governments to consider water purchase as a policy option has a number of adverse effects. Taken together, these effects greatly reduce the effectiveness of efforts to achieve sustainable management of Australia's water resources

Foregoing on-farm efficiency options

In the absence of a repurchase policy, policies have focused on increasing the efficiency of the irrigation network. There is relatively little incentive for irrigators to pursue on-farm efficiency improvements, since any water saved can be sold only to other irrigators.

As an example, farm-level studies commonly find that the adoption of water saving technologies such as centre-pivot sprays is not cost-justified in many contexts, given the prevailing market price for water allocations. However, governments are funding network efficiency improvements at a substantially higher unit cost for water savings.

Adoption of the water purchase option would permit greater improvements in water efficiency at lower total cost.

Absence of a cost-efficiency benchmark

Governmental refusal or reluctance to contemplate the repurchase option means that proposals to improve the efficiency of water use are being assessed in a vacuum. It is difficult to tell whether particular proposals are cost-effective or not. If the repurchase option were pursued on a systematic basis, it would provide a benchmark for cost-effectiveness

Loss of policy discipline

In the absence of well-specified efficiency benchmarks, there are strong political incentives for the adoption of a 'Vegemite' approach, in which funds allocated to the achievement of sustainable water use and lower salinity are smeared thinly across a large number of projects, with the objective of ensuring that every electorate and interest group receives at least some of the funding. There is also a tendency to favour grant-based systems in which well-organised groups capable of producing attractive applications are favoured, but 'where applications are not selected on the basis of maximising the cost-efficiency with which funds are used.

The Wimmera pipeline project

These problems are apparent in relation to the Wimmera pipeline project, one of the largest single projects funded through the NWI.

The project replaces a system of open channels running hundreds of kilometres from the Grampian mountains with pipelines. This follows an earlier project covering the Northern Mallee. The project is supposed to save 100GL per year, at a capital cost of \$500 million, shared equally between local, state and federal governments. The implied cost is \$5000 per megalitre saved, compared to a cost of purchased of between \$400/ML and \$1000/ML for water allocations in the system as whole.

The expenditure of \$500 million on repurchase would have been sufficient to increase annual flows by 500 GL, meeting the lowest of the three targets considered under the Living Murray Initiative.

Effect on irrigators and communities

Objections to policies of water repurchase have been made on the basis that such policies will have adverse effects on irrigators and rural communities. As regards individual irrigators, these claims seem implausible. For farmers who are willing to sell their water entitlements, the availability of the option of selling for environmental use increases demand, raises the likely price received and therefore reduces the economic and personal costs associated with adjustment from irrigated to non-irrigated agriculture, or out of agriculture altogether.

The effects on communities are less clear-cut. There are obvious problems associated with rapid and large-scale adjustment. However, adjustment processes are occurring all the time, many of them more drastic than a reduction in the use of a single input. A range of horticultural industries have suffered sharp declines as a result of the loss of overseas markets or (in the case of citrus) competition from imports. In these cases, major changes in production patterns have been associated with declining income and wealth. By contrast, purchase of irrigation water for environmental allocations would increase the value of water entitlements and the capacity of farmers continuing in irrigation to borrow and invest.

The environment as a residual recipient

Environmental sustainability is a central principle of the NWI. However, the effect of current policy is to maintain the status of the environment as a residual recipient of water, after all other demands are met. Additional water for the environment can be obtained only if there are technical options that permit this to be achieved without reducing effective availability for other uses.

The adoption of a repurchase option with an adequate budget would, in effect, place the environment on the same footing as extractive water uses, with a capacity to secure necessary flows directly through market transactions.

Overallocation and repurchase

The option of repurchase should not be considered to preclude proportional reductions in rights in cases where the existing volume of allocations is unsustainable. The principles of the NWI give a clear basis for distinguishing cases where irrigators should bear the cost of restoring allocations to sustainable levels from those where governments or society as a whole should bear the cost.

The central point of this submission is not to change these principles but to advocate repurchase as one of the options available to government in restoring flows to the environment.

Purchase of renewal rights

One possible option to address the needs of the environment in the long term, while minimising short-run adjustment costs, is proposed by Quiggin (2006). The proposal is based on the fact that most existing entitlements have a term of ten years or less, but will be converted into permanent entitlements as part of the NWI.

It is proposed to offer farmers a payment now, in return for the transfer to the environment of some or all of their entitlement at the expiry of the current term, normally about ten years from now. Analysis of prices for temporary and permanent water trades suggests that a significant volume of water could be purchased at relatively modest cost. In the meantime, needs for environmental flows might be met through temporary purchases of water or management of flood flows.

Rural-urban trade

Severe droughts affecting most Australian cities have brought the issue of urban water supply to the top of the policy agenda. At the same time, it is increasingly recognised that existing allocations of water for use in irrigation are environmentally unsustainable. Thus far, the two issues have been handled separately and with radically different approaches. While market exchange has been promoted in the irrigation sector, urban water use has been subject to increasingly stringent and specific controls.

An inconsistent policy of this kind can lead to substantial losses in efficiency and exacerbate the difficulty of reaching environmentally sustainable outcomes. It is necessary to give serious consideration to the option of allowing expanded trade between urban water users and irrigators.

It is, therefore worth considering some of the arguments for and against allowing or encouraging trade in water between urban and irrigation uses.

Arguments for trade

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. Under current institutions, residential water users typically pay marginal costs of between \$0.75 and \$1.50 per kilolitre, that is, between \$750 and \$1500 per megalitre. The price of irrigation water observed in the market for temporary transfers is commonly around \$100 per megalitre (note that this figure and all those expressed here are in terms of annual costs for supply of water in a given year), though this figure varies widely.

Hence, it seems reasonable to suppose that if irrigation water users could sell water to urban users for, say, \$200 per MI, and the costs of treating and delivering this water were say, \$400 per MI, residential consumers would want to buy additional water. As in the usual economic arguments concerning gains from trade both parties would be better off.

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 per MI saved.

Arguments against trade

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'. The central idea is that the group of irrigation users

in a given catchment has an obligation to maintain the irrigation infrastructure in that region and perhaps to deliver a return to owners of capital (in many cases, a cooperative owned by some group of users). If some users sell their water entitlements to users in another catchment, the costs of the infrastructure will be spread over the remaining users. Either unit charges will rise or the owners of capital will incur a loss.

The point that transfers of water entitlements out of a catchment reduces the value of irrigation-specific infrastructure in that catchment holds true fairly generally. However, the distribution of these costs (and the benefits accruing to the enhanced value of infrastructure in the receiving region) depends on details of pricing and institutions, some of which are quite subtle.

The idea of stranded assets may be extended further, to encompass social infrastructure such as schools, hospitals and banking services. If transfer of irrigation water entitlements out of a region results in a shift to less intensive dryland agriculture, and a corresponding decline in the farming population, demand for the services of social infrastructure will decline, and this may lead to second-round effects, with schools and other services closing.

The issue of asset stranding is complex, but it is important to recognise that it is mainly a matter of adjustment costs. Hence, the appropriate response is to mitigate those costs rather than to prohibit trade altogether.

Critics of trade between urban and irrigation users raise 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.

Similar arguments apply to water. There are reasons to be careful before moving to unrestricted trade in water rights. Poorly thought out moves in this direction have

produced unforeseen consequences such as the activation of unused, but now valuable water rights (called 'sleepers') thereby exacerbating the problem that trade was meant to resolve. Nevertheless, in the long run, water should be allocated to its most highly valued use, and the standard way of doing this is through market transactions.

Potential volume of trade

Estimates of the potential volume of trade may be made either at an aggregate level, or by considering the cases of the major cities separately. A back-of-the-envelope estimate may be obtained as follows. 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 maximum volume involved would be around 750 GL each year.

In practice, the likely maximum volume seems smaller. The options for transferring water to Sydney and South-East Queensland are limited, as are options for Perth that have not already been exploited. Growth in demand for water in Adelaide is likely to be limited in view of the city's relatively slow population growth. Thus, the most important potential transfers are those from the Murray catchment to Melbourne. As has been noted, public policy in Victoria has long been opposed to trade between the Murray catchment and Melbourne, and this opposition has not diminished thus far.

Under current conditions, then, trade in water between irrigation and urban use is likely to remain relatively limited. Nevertheless, even modest trade could significantly reduce the severity of urban water supply problems. On the other side of the market, although the impact on the aggregate supply of water for irrigation would be modest, irrigation water use in some catchments might be reduced significantly.

Moreover, it should not be assumed that current conditions will persist indefinitely. Climate change might exacerbate the drought problems now being experienced in most urban centres. Moreover, the feasibility of desalination, the main backstop technology, depends critically on energy prices. A sustained increase in the cost of electricity could greatly increase the cost of desalination.

Concluding comments

The need to address the problem of salinity is generally recognised, as is the desirability of using market-based instruments. However, the refusal of most governments to contemplate the most basic of market-based instruments, repurchase of excessive allocations of irrigation water, has resulted in inefficient allocation of resources and wasted effort, and will continue to do so.

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