

# **Water – The Role of Markets and Rural-To-Urban Water Trade: Some Observations**

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## **Introduction**

The concept of water markets and their attraction to economists is well established. Moreover, the compelling arguments presented by Gary Libecap and the salient examples he has provided should resonate with an audience of economic regulators, such as this. Regrettably, those of us who have watched the evolution of water policy in this country for several years might need to be forgiven for feeling somewhat more pessimistic (and dare I add just a little cynical).

The real challenge around water policy in this country does not hinge on debate about the elegance of the market and its structure. Rather, the issue is more fundamental – namely, what is the most sensible way to address water scarcity in a nation of enormous hydrological variability (in spatial and temporal terms) and how do we persuade governments to resist dabbling with resource allocation in an effort to address what are ostensibly concerns about income distribution?

In the short space available I endeavour to shed some light on the second of these issues. In the context of the first issue, suffice to say that ‘one size does not fit all in a country like Australia’, a point often lost on those who advocate handing all manner of problems to federal bureaucracies in search of a solution. For example, a robust water market that allows trade between sectors makes much more sense for cities like Canberra, Adelaide and Melbourne, than it does for Sydney or Darwin.

The remainder of this short response is divided into three main parts. In the following section I attempt to explain the underlying problems that arise from the contradiction between market mechanisms generally and the subsidisation of infrastructure under the guise of irrigation ‘renewal’. The penultimate section is used to consider the relationship between urban water tariffs and water market participation by water utilities before offering some brief concluding remarks.

## **Markets and Irrigation Renewal**

Markets certainly offer much promise, particularly where users with varying economic values already enjoy a hydrological connection. In addition, there is ample scope for markets to accompany infrastructure works that ultimately provide that connectivity, say in the case of the north-south pipeline currently under construction in Victoria. While most economists realise that a market will move a resource to its highest value use, the real question when it comes to water is ‘whose values actually count?’

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Water markets have been very active in the southern Murray-Darling Basin, as Gary has articulated. However, inter-sectoral trades are relatively rare, even if you consider the environmental claimants as a separate sector.

By and large, the reason for this is that the politics of inter-sectoral trade are considered too costly and a policy stance has emerged that subverts and obscures many of the incentives for trade. Perhaps the most useful way to consider these impacts is not through urban-rural trade but by focussing on the efforts of governments in the Murray-Darling Basin to restore some ecological balance by reducing irrigators' calls on the resource.

Irrigation is by far the largest user of water and any redistribution to either environmental or urban claimants implies less for agriculturalists. Moreover, the historical and excessive enthusiasm for allocating water to agriculture in the Murray-Darling Basin has resulted in an over-allocated system where the rights of all users are constantly threatened by excessive extraction. Quiggin (2001) carefully described the problem and suggested that several courses of action were on hand to deal with it. These range from market purchase of rights from willing sellers to subsidised infrastructure to improve water use efficiency.

Greatest enthusiasm has been displayed for the latter approach, as evidenced by the current distribution of funding for 'irrigation modernisation' versus water buyback under the Rudd governments *Water for the Future* manifesto.

The major problem with this policy approach is that despite its political allure it is seriously flawed on other fronts. The political appeal stems from the fact that public monies provided by 'the many' can be generously redistributed to the vexatious few and seems to lose anything as a result. In simple terms, water use efficiency is supposed to provide water 'savings' that can overcome the overallocation problem without a diminution of agricultural production.

Regrettably, such projects are seriously flawed on economic grounds primarily because they treat water as the only input in agricultural production and overlook the cost of infrastructure works against the value of the agricultural output. As markets have emerged for water and it has assumed a tradeable value, most sensible water efficiencies have already been adopted by the irrigation industry. This applied both at the farm level and the communal irrigation district level.

The purported market failure used to justify lavish publicly-funded projects to 'save' modest amounts of water in irrigation resides in the supposedly slow adoption rate of farmers<sup>2</sup>. In reality farmers are quite rational folk and seldom waste money on gadgets that don't deliver a discernable benefit. The upshot

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<sup>2</sup> David Pannell has written extensively on the adoption of technologies by farmers. In most cases where the technologies are not adopted it is because they do not make economic sense – there is a disjunct between what the paternalistic bureaucracy says is economically viable and what the firm knows to be economically viable.

is that water that is purportedly recovered from such projects is far more costly than the market value of that water, and irrigation activities have become burdened with excessive capital, relative to the value of outputs<sup>3</sup>. The true extent of this folly is likely to be exacerbated by changes to flow regimes as the effects of climate change materialise<sup>4</sup>.

The hydrological limitations of this approach are also significant. The genesis of these problems is the inability of proponents of 'irrigation modernisation' to conceptualise water use at an appropriate scale. What needs to be understood is that a fully allocated river system creates very few opportunities to 'save' water. This subtle point is still not fully understood by many governments. For instance, the Victorian government recently released guidelines for measuring water 'savings' from irrigation upgrades<sup>5</sup>. Regrettably, even the guidelines deliberately focus on a narrow irrigation district as the unit of analysis.

Gary Libecap hinted at the extent of this broader problem in his discussion of return flows. Most water use efficiency projects do not 'save' water per se – they reallocate it in time and in space. The water that is supposedly saved did not leave the catchment and in many cases underpinned other uses or users – say in the form of environmental flows or baseline interconnecting flows between groundwater and surface water. To respecify this water as a 'saving' is either naive or deliberately mischievous. In any case it hardly deals seriously with over-allocation and regrettably, produces perverse spinoffs for the market.

First, water use efficiency projects (aka subsidised irrigation infrastructure) by their design raise the productivity of water within the project area, but ultimately reduce the reliability of water rights held outside the project area. The first issue is relatively straightforward and is tied to the enhanced marginal product of the resource as a result of the additional (publicly-funded) capital. The second results from the fact that return flows are generally reduced to downstream claimants when an irrigation system becomes more 'efficient'. Coupled with a water market there are serious consequences.

On the one hand, agriculturalists outside the project area will be forced to purchase additional water rights should they wish to maintain their current production practices. On the other hand, others seeking to purchase water rights will increasingly be presented with rights that are specified outside the project areas – and these are characterised by declining reliability.

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<sup>3</sup> As an aside, this creates an interesting conundrum from economic regulators. Having saddled irrigation districts with expensive infrastructure, many districts will undoubtedly struggle to provide an adequate return to or return on that capital. Much of the newer technology also appears to have a shorter life span than the more rudimentary technologies. Will the taxpayer be asked to foot the bill for upgrades in a few years time, or will economic regulation insist that water prices recover all costs?

<sup>4</sup> Some recent work by Connor et al. (2009) indicates that capital intensive perennial agriculture becomes less profitable as water reliability declines with reduced streamflow.

<sup>5</sup> It would appear that this arose begrudgingly from mounting public concern about the shoddy calculations that were used to justify the \$2 Billion of public investment in the Northern Foodbowl Modernisation Project.

This has serious implications for those who would seek to purchase water in a market setting, whether they be urban utilities wishing to alleviate the impost of draconian water restrictions, or environmental agencies seeking to provide an environmental benefit. In simple terms, water rights will be increasing in price and those rights that are most commonly offered for sale will be of lower reliability.

By way of contrast, were a benevolent (and economically literate) dictator to assume power, irrigation would compete more directly for its infrastructure requirements and its access to water. The outcome would accordingly more closely align with Gary Libecap's predictions about the efficacy of water markets.

### **Urban Water Tariffs and Market Incentives**

In the previous section I tried to highlight some of the economic fallout that results from the political dimension to the current stance on water. From the perspective of an economic regulator one might argue that this is 'beyond our sphere of influence (aka interesting but all too hard)'. Asking regulators to bring some sense to policy is a tall order so I thought it would be useful to deal with something less ambitious, but nevertheless significant.

The modest insights in this section emanate from the fact that (for my sins) I live on a state border. In one jurisdiction (NSW) urban water is managed by the local government, at least in regional areas. In the other jurisdiction (Victoria) water services for towns are managed by water corporations that are basically state entities. The latter tend to be much larger and with arguably more dedicated expertise<sup>6</sup>. There are also non-trivial legislative and administrative differences.

An issue that is nevertheless puzzling for residents of communities that straddle a state border, like Albury-Wodonga, is the differing approaches to urban water restrictions. This is even more puzzling when the jurisdictions draw water from the same source with similar scarcity constraints.

In Albury (NSW) the community has just moved to (aka the Council is now imposing) Stage 4 urban water restrictions, which results in a ban on all outdoor watering. If continued through summer, this usually manifests in substantial loss of amenity and, in some cases, very undesirable social outcomes<sup>7</sup>. By way of contrast, modest restrictions are in place in the adjoining community of Wodonga (Victoria) and the urban water utility has publicly foreshadowed no substantial behavioural restriction for the summer months.

Perhaps not surprisingly, the local government politicians in Albury have sought standardisation of water restrictions and even implied the need for

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<sup>6</sup> There are differing views about the merits of alternative institutional arrangements for managing urban water services as witnessed by the vitriol in south-east Queensland and the more recent debate about modifying water and wastewater services in NSW (see for example, Brian Dollery 2009).

<sup>7</sup> A detailed list is available from Cooper 2009.

Federal intervention to resolve the anomaly. However, the contradiction between jurisdictions is more rudimentary and carries salient lessons for economic regulators.

In Albury, and in line with purported 'best practice' in that state<sup>8</sup>, the water tariff comprises a fixed component and a volumetric inclining block tariff (IBT). The first tier of the IBT is set at about 50 cents and the fixed charges are substantial at over \$500. The first tier does not expire until about 225 kilolitres which means many households do not reach the second tier, especially when outdoor restrictions are in place. By way of contrast, Wodonga residents face a more modest fixed charge (circa \$370) but a much higher volumetric charge, set at about three times that faced by Albury residents (i.e. about \$1.50 per kilolitre). In the case of Wodonga, the tariff must be sanctioned by the economic regulator (ESC) and the decision by the utility to place greater emphasis on the volumetric charge emanated from research that showed that this was actually consistent with the preferences of their customers.

Regardless of the source of the differing tariff structures the contrast for urban water consumers in the context of water restrictions is stark. Similarly, the varying enthusiasm for using rural-urban trade to alleviate the consequences of scarcity could hardly be more profound.

Albury Council has very little incentive to enter the water market under the current arrangements. Water allocations were commonly traded on the market last year for between \$300-\$400 per megalitre (i.e. 30-40 cents per kilolitre). Coupled with the cost of treating and delivering this raw water, there is very little scope for Albury Council to recover cost, should they be bold enough to enter the market. Arguably, the risk minimisation embodied in the comparatively high fixed charge also has implications for the willingness of local governments (or utilities generally) to impose restriction regimes on the citizenry.

In contrast, residents of Wodonga are unlikely to have their water use severely constrained in the near future. It is plainly not in the Victorian water utility's interests to do so since the business case for entering the water market is clear (buy raw water for 40 cents, treat for say 20 cents and sell for \$1.50).

Whilst dealing with a relatively limited case area, the lessons for economic regulators should be apparent. First, the structure of urban water tariffs plays a major part in heightening (dampening) the enthusiasm for utilities to enter the water market. This should not be understated. State bureaucracies remain nervous about the political implications of trade and are all-too-willing to 'lean on' those that would use the market to benefit their constituents/customers at the potential expense of state-wide political disharmony. Having a compelling business case supported by empirical

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<sup>8</sup> Local governments are not directly subject to economic regulation for water and wastewater in NSW. Alternatively, they are required to follow a 'best practice' procedure specified by the administering state department.

evidence and the support of the economic regulator is pivotal to winning this argument.

Second, the distribution of risk embodied in tariff structures appears worthy of more empirical analysis. As it stands, the 'split' between fixed and volumetric charges is informed by (often antiquated) accounting methodologies, notions of customer equity and the risk appetite of utilities. A more precise analysis of how this interplays with motivations for innovation and the willingness of water utilities to access the market may be of use.

### **Concluding Remarks**

Gary Libecap's analysis of water markets provides forceful evidence for continuing on a reform path similar to that detailed in the early CoAG agreements in 1993-94 and the National Water Initiative of 2004. This approach emphasised the importance of cost recovery pricing and the pivotal role of objective assessment of infrastructure investments in irrigation. Regrettably, water policy has 'lost its way' in more recent times and the enthusiasm for subsidising irrigation infrastructure should concern both taxpayers and regulators. The side-effects for markets have not received adequate attention and scrutiny of the economic and hydrological merits of publicly-funded projects in this field is seriously wanting.

Dealing with these deficiencies is no simple task. Political leaders need to be convinced of the deleterious long term consequences of an engineering-centric approach to water allocation problems – an approach that has already gained considerable momentum. Taxpayers (voters) will also need to be adequately motivated to limit the excesses of the water use efficiency saviour dressed in engineering regalia. Assisting with this task might be a step too far for some regulators but worthy of pursuit nonetheless.

On a more immediate front there is scope for greater analysis of water tariffs. IBTs are still common place in many jurisdictions, regardless of their widely acknowledged dubious characteristics. There is also scope for additional analysis of the motivational effects within utilities of differing tariff structures and their interaction with water markets.