The Contradiction between Modernising Irrigation and Water Buyback

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Introduction

Until the late twentieth century, Australian governments, like many other administrations, viewed the development of water resources as a priority and saw the resource itself as a source of national prosperity. Accordingly, generous allocation of water, particularly for agricultural pursuits, was seen as a precondition to food security, increasing national product and achieving social cohesion via the development of a noble yeomanry (Musgrave 2008). However, achieving these objectives against the backdrop of Australia's hydrology and climate proved particularly challenging. In simple terms, the variability of Australian climate and the factor endowments of the nation meant that irrigated agriculture was always destined to struggle on economic grounds alone (see, for instance, Davidson 1969).

In the 1990s these economic forces combined with greater concern for fiscal accountability and emerging environmental interests in the 1990s to usher in two major reforms in water policy. The first was the Cap on water extractions collectively agreed by signatories to the Murray-Darling Basin Agreement. The ambition of the Cap was to limit the growth of surface water extractions to existing levels of development. The second was the introduction of the Council of Australian Governments' (CoAG) water reform agenda. An important component of this agenda was that water rights were to be separated from land and made tradeable.

Perhaps ironically, an inherent conflict arose from these two policies. The source of this conflict was the large number of claims on water resources that were in existence at the time. Moreover, the decision by most state jurisdictions was to honour three main rights: statutory claims with a history of use; statutory claims with no history of use, and; non-statutory claims with evidence of a history of use. Regrettably, the quantum of water attending these claims was fundamentally in excess of the Cap. Moreover, the Cap itself is often seen as grossly inadequate for dealing with the longer term ecological sustainability of the river system (MDFRC 2009).

Addressing the over-allocation of water resources in the Murray-Darling Basin is thus amongst the most pressing and difficult policy dilemmas facing governments. This brief article is used to position the current policy stance and reflect on the inherent weaknesses and contradiction embodied in the status quo. More specifically, the contradiction between public investments to 'modernise irrigated agriculture' and the buying back of water rights is analysed. The paper concludes with a brief assessment of the practical means of overcoming (or at least limiting the impacts of) this contradiction.

Dealing with Over-Allocation

In his highly acclaimed article on the environmental economics of the Murray-Darling Basin, John Quiggin (2001) notes that there are four rudimentary

policy choices for dealing with an over-allocation problem of this form. These comprise:

1. Government purchase of water rights (buy-back)
2. Allowing rights to degrade over time (say, by reducing the call on the volume of water at the termination of water plans)
3. Insisting that water users achieve a water efficiency dividend over time
4. Public investment in water use efficiency measures to reduce the overall call on the resource

Perhaps not surprisingly, most interest and public resources have been directed at the last policy choice. After all, the political backlash from subsidising infrastructure investments in irrigated agriculture was unlikely to be too harsh, particularly given the deplorable state of knowledge about water affairs amongst the general public[1].

For instance, in September 2004 the Prime Minister announced the establishment of a $2 Billion Australian Government Water Fund with the lion's share ($1.6 Billion) dedicated to the Water Smart Australia Program which aimed primarily to "accelerate the uptake of smart technologies and practices in water use across Australia …[with most support] directed to practical on-the-ground projects" (NWC 2005, s1-1). Similar enthusiasm for infrastructure refurbishment was evident in the $10 Billion *National Plan for Water Security* announced by Prime Minister Howard in January 2007. In this case almost $7 Billion was directed at reconfiguring irrigation through public investments in infrastructure.

The election of the Rudd government resulted in the release of *Water for the Future* in April 2008. In this instance there was to be $13 Billion expended over ten years. As with its predecessor, this policy foreshadowed that most expenditure would be directed at modernizing irrigation with $5.8 Billion assigned to "investment towards improving the efficiency and productivity of water use and management" (Wong 2008, p. 9).

In a departure from pervious policies, *Water for the Future* dedicated a specific budget for the re-purchase of water to address over-allocation.

The Contradiction

The basic premise for providing additional public investment to 'modernize' irrigation is that such investments will reduce 'waste' which can then be reassigned to deal with the over-allocation problem. In economic parlance, it might be argued that private irrigators will not undertake the optimal investment in infrastructure and public intervention is warranted on the grounds that the water purportedly 'saved' can then redeployed for the provision of a public good – say in the form of an enhanced riverine environment.

[1] This is most often evidenced when politicians resort to the number of swimming pools or the volume of water in Sydney Harbour as the preferred metric for measuring the efficacy of public expenditure on irrigation.

Clearly, proponents of the public failure doctrine might question the efficiency of this intervention. More specifically, several pieces of information would be required in order to make intervention with subsidized infrastructure efficiency-enhancing. First, the value of any environmental enhancement would need to be known lest the policy maker run the risk of over or under investment in environmental change. Arguably, this lack of information has bedeviled all forms of policy response in this context. Second, and most critical in this setting, is that there needs to be a reliable and verifiable means of articulating the water that is purportedly 'saved' as a result of 'modernizing' irrigation. Third, and in a related manner, mechanisms need to be in place to ensure that the water that is purportedly saved is then redirected to the provision of public goods and not appropriated by private interests.

Collectively, the last two information challenges have resulted in major public policy failures in numerous other settings (see, for example, Perry 2007; 2008), all in the name of 'water use efficiency'. More specifically, water use efficiency is itself a conceptually vexatious issue primarily because in an over-allocated or fully allocated catchment, water can seldom be 'saved' at a catchment scale. Put simply, any calculation of water 'saved' on one farm (or one foodbowl) needs to also take account of the fact that others have existing claims to that which was previously spilled and perceived as 'going to waste'. Several analyses are available to show that, in many cases, water use efficiency projects do little more than reallocate water in time and space, often away from the claimant with the weakest or least-well-defined rights (see, for example, Perry 2009).

An important upshot is that investing in such infrastructure potentially reduces the reliability of water, particularly for interests downstream from the investments in modernization. These events are made more acute by the fact that Australian jurisdictions operate under gross entitlement regimes, not net entitlements. In simple terms, the supply of water is not increased for all by these projects, and for many users will actually be reduced. Thus, in order to maintain water-using activities at the same level, those outside the modernization project will invariably be forced to purchase additional water (i.e. to offset the decline in reliability). Alternatively, owners of these rights might chose to sell them, but it needs to be understood that they should now be of less value insomuch as their reliability has been degraded.

A second major ramification of investments in irrigation infrastructure relates to the direct impacts on the demand for water within the project area. Water is but one input used in irrigated agriculture[2]. Thus, investments in irrigation infrastructure can be reasonably expected to impact on the marginal value product of water; each unit of water should be more productive by virtue of more timely application and greater control. After all, these arguments have been commonly invoked to make the initial call on the public purse (see, for example, DSE 2008). Economists have long argued that the demand for inputs, like water, is a function of the marginal value product associated with

[2] This simple point seems to have escaped many who would have all manner of decisions made on the basis of water inputs alone. See, for example, the spurious notion of 'virtual water' proffered by Maude Barlow and others.

that input. Thus, increases in marginal value product can be expected to result in increased demand for water.

Of interest here is the resulting impact on the availability and price of water in a market setting. The impact of irrigation modernization is twofold:

1. reducing reliability of supply for those outside the project forcing them to purchase more water rights or exit the industry while offering up their now lower reliability rights;
2. increasing demand for water in agriculture within the project.

It follows that the price of water rights should rise.

This has significant implications for the operation of other policy approaches aimed at dealing with over-allocation[3].

Earlier it was noted that buyback of water rights is now a much-publicized part of the policy mix. Once demonized as the 'policy of last resort' buyback is now openly acknowledged as a sensible means of "putting water back into rivers" (Wong 2008). More recently, attention has also been given to buyback as agencies strive to meet their obligations under the Living Murray program that sought to reassign 500 Gigalitres to the Murray River as a first step to achieving environmental balance.

Notwithstanding many reservations about the operational dimensions of current programs (see, for instance, Crase et al. 2009), buyback programs generally proclaim to be seeking "value for money" (see, for example DEWHA 2008; DSE 2007). Surely, there are at least two critical elements where the simultaneous use of public funds to subsidize irrigation modernization is at odds with this criterion.

First, one component of value for money relates to the quantum of water that can be purchased from willing sellers for the least expenditure of public monies. Given that infrastructure projects raise the marginal product of water in agriculture, such projects actually reduce 'value for money' from buyback. More public funds will be required to secure a given quantum of water where buyback is accompanied by irrigation modernization.

Second, the intention of buyback is to improve the ecology of the Murray-Darling system by ensuring that there is sufficient water to meet environmental needs. To date, buyback has employed an expression of interest process seeking the involvement of willing sellers[4]. It follows from the impacts of infrastructure on the demand for water that the most likely sellers in

[3] As an aside, this sheds a different light on the increasing prices witnessed for water rights. The irrigation lobby has bemoaned the decision by governments to purchase water rights on the grounds that this is driving up the price of water. To the knowledge of the author there is no empirical analysis of the impacts public investments in irrigation infrastructure on water prices.

[4] An important caveat here is the intervention by the State of Victoria. This was initially in the form of a 4% cap that limited the sale of water outside irrigation districts. It now takes the form of government agencies having the power of veto over sales. This locks some irrigators into areas ear-marked by the bureaucracy as being 'too valuable' to resort to dryland farming.

any water buyback program will be those outside the 'modernization zone'. Moreover, it has been argued that these water rights are now subject to lower reliability than might be historically expected as a result of the impacts on return flows due to 'modernization'. Thus, governments are not only forced to purchase rights at a higher price because of the public investment in irrigation infrastructure they are also likely to be purchasing rights subject to relatively low and declining reliability, again thanks to the investments in infrastructure. Buyback will yield lower reliability rights when accompanied by a modernization program.

Way Forward

The contradiction described in the previous section represents a major conundrum for policy makers. Government leaders on both sides of politics have publicly espoused the benefits of irrigation modernization and to withdraw support carries non-trivial political risks. Some have advocated radical solutions, such as the acquisition of all water rights followed by an auction of a smaller quantum of rights back to those most willing to pay (see, Young 2009). Such an approach is likely to be politically unacceptable and more pragmatic mechanisms are suggested here. These comprise both short and long term strategies.

The initial reforms to which all state jurisdiction agreed in 1994-5 required "that all future investment in new schemes or extensions to existing schemes be undertaken only after appraisal indicates that it is economically viable and ecologically sustainable" (CoAG 1994). This condition remains implied within the National Water Initiative, although arguably it has not been given much weight in recent years. In a similar vein, much of the irrigation upgrades funded by the Commonwealth was to be subject to 'due diligence' procedures before proceeding. A more vigorous application of these principles could potentially stall or even halt some of the more ambitious engineering escapades. This would, as a minimum, provide additional breathing space for buyback to be undertaken more effectively. It would also provide more opportunity to make public the benefits bestowed on many communities by buyback (see, for example, Dixon, Rimmer, Wittwer 2009).

A major challenge will be the desire from some governments for Keynesian-style public infrastructure spending to deal with contemporary concerns about wider economic malaise. Nevertheless, there appears to be scope to deal with this through other expenditures without invoking the perverse effects associated with irrigation modernization.

Enthusiasm for projects in the 'water saving' genre stems from a naïve conceptualization of water resources and heroic assumptions about the capacity of engineering to deal with an 'inconvenient hydrology'. Both of these matters can be dealt with over time, especially by raising public consciousness of the costs that beset such endeavors. Research can play an important part here by empirically assessing the dual impacts of buyback and public infrastructure investments. The recent article by Lee, et al. (2009) is a useful example of such work. However, in order to have a broader and more sustained impact it will be necessary to make research accessible to the

voting (and taxpaying) public. The returns on expenditure directed in this area stand to be much higher than those that attend the present lavish expenditures on irrigation upgrades.

References