Getting the balance right - water policy & management implications

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- The paper discusses the balance in the water debate and policy, between the use of water for agriculture and the use of water for urban, industrial, environmental, and recreational purposes
- There is evidence for better water use effectiveness by irrigators in recent years, and the value of irrigation production at regional and national levels is well recognised
- In the current debate, irrigators need to increase their direct involvement with managing the rivers and the dependent ecosystems to achieve a better balance between the productive use of irrigation water and the maintenance of the wider values associated with the same water

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Introduction

What balance are we talking about? Fundamentally we are concerned with the balance of water extraction, primarily for irrigation and the amount and seasonality of water left in the river system. We have increasingly recognised that water in the river supports a host of aquatic and near river ecosystems. Valuing tangible production relative to the less tangible benefits of functioning ecosystems is the challenge we are faced with and a major reason for the current popular debate. Intertwined in this is the extraction of water for urban and industrial use, the need for water to transport salt from the landscape, the maintenance of river levels for recreational purposes and a complex mix of aesthetic and cultural expectations.

Let's look at what water availability means for irrigation activity and its dependant communities using a summary from a very recent collation of information on irrigation in the Murray and Murrumbidgee basins (Meyer 2005).

Irrigated regions in the Murray & Murrumbidgee basins

The irrigated areas of the Murray and Murrumbidgee basins were grouped into ten regions as illustrated in Figure 1.

Within the study regions, the total area irrigated grew by 21% between 1996–97 to 2000–01 to reach 1,243,000 ha. This accounted for 49% of the total irrigated area of Australia.

Of the 10,960 GL of water diverted for irrigation in the Murray-Darling Basin, 8,608 GL (78%) were diverted by the regions in this study. Within these regions, 6656 GL (77%) were recorded as being delivered to farms.

Irrigation – what does it produce & how much is it worth?

Water for irrigation is directed through an extensive channel and drainage system infrastructure that has an estimated replacement value of $3.8 billion. This off-farm investment is complemented by an asset value on-farm of $6.3 billion. At the farm level the frequency of different application systems is in the ratio of 83:10:7, surface:sprinkler:micro, respectively.

With all this infrastructure, water and expertise, what does irrigation in these regions produce? They produce 19% of Australia's vegetables, 50% of all fruit and nuts and 63% of all grapes. The combined estimated revenue for these commodities is $1.7 billion or 40% of all fruit, nut and vegetable production (irrigated and rain-fed) in Australia.

The largest estimated profits for 2000-01, in aggregate, were generated by dairy ($329m), grapes ($289m) and fruit and tree nut crops ($126m). As expected, the largest profits on a per ha and per ML basis were the intensive horticultural activities; vegetables ($941/ML), grapes ($651/ML) and fruit and tree nut crops ($472/ML).

Comparing irrigated and rain-fed districts shows that the

total water input from irrigation above rainfall was 2.4 times greater (4.47 ML/ha rain-fed, 10.93 ML/ha rain plus irrigation), with a revenue generation that is 13.1 times greater ($52.45/ML rain-fed, $686.83/ML rain plus irrigation). This increased revenue supports a level of economic activity that is three to five times greater than in the adjacent rain-fed district. The population is greater; there are more businesses, more total employment and significantly more services.

The combination of "upstream" and "downstream" dependant activities associated with dairy, fruit, vegetables and wine grapes has an average economic multiplier of 3.5. This indicates that for every $1000 of farm gate revenue generated, there is an additional $3500 of dependant economic activity.

There is a substantial difference between those regions in the east, essentially those on the vast Riverine Plain and those in the west within the Murray Basin geological region (ie Sunraysia, Riverland and Lower Murray). The NSW Murray region irrigates 321,000 ha with a diversion volume of more than 2000 GL to produce irrigated revenue of about $310 million. The Riverland region irrigates 36,000 ha with a diverted volume of 311 GL to produce irrigated revenue of $555 million.

Irrigation & its effect on resources

Water diverted by the Murray and Murrumbidgee regions accounted for 79% in 2001–2002 and 81% in 2002–2003 of all the water diverted for irrigation in the Murray-Darling Basin. With total diversions in the MDB of 10,000 to 11,000 GL per year, and an estimated annual discharge from the Murray of 12,500 GL prior to development, it should be expected that flow and seasonality conditions in the river stem are markedly different.

The difficult dilemma of managing a river, both as a landscape drain and as a water supply system is nowhere better illustrated than in managing salt. Exporting salt from irrigated (and rain fed) areas and discharging into the river is, in part, mimicking a natural process. However, for people and systems downstream, this can cause unacceptable water quality decline. Long term irrigation is not possible, if salt, accumulated during transpiration and evaporation of water is not drained away from the root zone of crops.

Drainage infrastructure, both surface and subsurface is a large asset of irrigation systems. It is estimated that 200,000 ha or 17% of the irrigated area has some form of sub-surface drainage. It is expected that this area will increase by at least 20,000 ha involving a capital expenditure of $55 million to $75 million as greater areas of high value crops are planted.

Irrigation, water management, "the Cap" & water trading

The imposition of the Murray-Darling Basin "Cap" from 1995 was designed to limit total extraction of water from the rivers to "1993–94 levels of development". For the Murrumbidgee and Murray systems the annual cap volume is approximately 8,734 GL. With water trading, intrastate temporary trade is by far the largest turnover with between 500 and 900 GL being traded annually since 1994-95. Interstate permanent trade in a limited area on the Murray has been quite small (annually less than 5 GL) with the net result since 1998–99 of 14 GL being traded into the Riverland and Lower Murray regions of SA. In northern Victoria, the volume of water permanently traded out of the three regions (Upper Murray, Goulburn Broken and Loddon Campaspe) for the period between 1990 and 2003 is 64 GL or 2% of the total annual diversion for these regions. During this time the average price has ranged from $705/ML in a full allocation year to $1235/ML in the water short 2002–03 season. Prices for temporary transfer have ranged from $34/ML in 2000–01 up to $364/ML in 2002–03. All the indications are that trade in water entitlements will increase.

Improved water productivity & water savings

There is some evidence that water productivity (commodity produced per unit of water) has improved over time. Most increases are due to increased yield rather than decreased water applied.

Information largely developed through the Pratt Water Initiative in the Murrumbidgee Valley has indicated that significant water savings are possible associated with both the distribution system and the on-farm application system. With the irrigation area distribution system, more than 10% of total delivery could potentially be saved through greater control, reduced channel seepage and suppression of channel evaporation.

Management response to current water policy

The influences of national level policy have come through the Council of Australian Governments decisions on water, through extension of national competition policy and most recently from the intentions signalled in the National Water Initiative. The separation of water entitlement from land ownership has facilitated water entitlement trading at an unprecedented level. In turn, a new valuation of water has occurred as indicated previously, which has already been shown to respond quite directly to water availability. Thus far, the fear that permanent water trade out of a particular region will result in substantive "stranded assets" has not

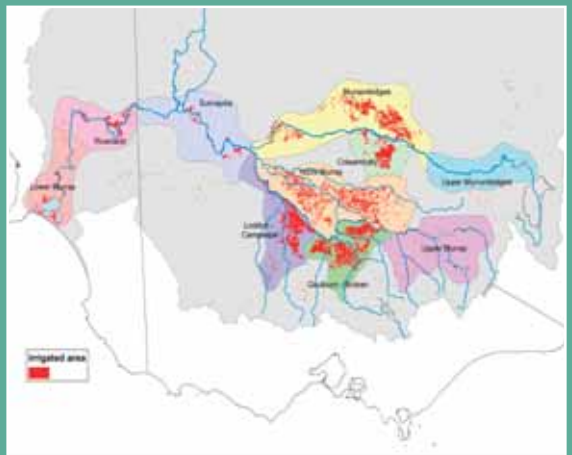

Figure 1 *Location of the nominated regions and distribution of irrigated land area in the Murray and Murrumbidgee basins*

eventuated. While this may still happen there is some indication that the asset value of water entitlement may allow some low productivity irrigation, for example from salt affected areas to cease. In turn this is likely to help adjust and improve supply infrastructure to more productive areas.

The Cap in the Murray-Darling Basin had the immediate effect of focussing attention on the finite volume of water available in any year and in turn, on the productivity value of water. Rather than stifling irrigation development, as was anticipated, the data from 1996–97 to 2000–01 shows that the irrigated area increased by more than 200,000 ha. It is reasonable to conclude that this came about because both delivery system and on-farm application tightened their management and a greater proportion of the diverted water was applied to crops and pastures.

At a national and state level, a major motivator for regional development is the desirability of increasing the economic productivity from the use of resources, often expressed in terms of $/ha or $/ML. The study of irrigation in the Murray and Murrumbidgee illustrates that large returns are almost always accompanied by large capital and skill investment, although this does not necessarily lead directly to high profit – a major and critical determinant of enterprise viability. Irrigated farm businesses that are successful because they are profitable and operated by satisfied people come from the full spectrum of operations, from intense horticulture, large area cropping and dairying. In these cases policy should not try to influence what should be grown but rather the conditions of operation that minimise degrading and off-site impacts need to be clear and enforced.

As part of the increasing concern for natural resource management, the state governments have developed regional institutional arrangements vested with greater responsibility for maintaining and improving water, land and vegetation condition. Every major irrigated region in the Murrumbidgee and Murray basins has developed and is implementing some form of natural resource management plan.

The next step in developing a framework in which the compromises and trades between the overtly productive use of water and the maintenance of resources for multiple uses including recreational, aesthetic and cultural has been signalled through the "Living Murray" process. Irrigators can make a substantive case that demonstrates the value of their productivity for their districts, regions and to the nation. They will need though, to increase their direct involvement with managing the rivers and the dependant ecosystems to achieve a better balance between overt productive use and maintenance of the wider values associated with water.

Refrences

Meyer, Wayne S. (2005). The Irrigation Industry in the Murray and Murrumbidgee Basins. CRC for Irrigation Futures Technical Report No. 03/05. April 2005.

Further information

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Key messages

Australia's water debate continues to skirt around the intricate connection between irrigation water use and retaining water for other uses. Irrigation, its productivity, economics and community interdependence must become an explicit and bigger part of the water policy debate to redress a current imbalance.

At a regional and enterprise level, diversity and adaptability of production, water delivery and services must be increased if resilience to climate, water availability and markets is to be fostered. Policy that encourages diversity and adaptability is needed, that which focuses on conformity and restricting opportunity will serve us poorly.

There is opportunity for increased irrigation water productivity mainly through improved delivery system and application management. Water entitlement trading has moved a small amount of water to higher value production although the greater value has probably come from the increased flexibility that irrigators have used with temporary transfers, particularly during the recent dry periods. The evidence from irrigation water use in recent years is that water use effectiveness has improved and can still get better.

Irrigators can make a substantive case that demonstrates the value of their productivity for their districts, regions and to the nation. They will need though, to increase their direct involvement with managing the rivers and the dependent ecosystems to achieve a better balance between overt productive use and maintenance of the wider values associated with water.