Trading in water entitlements in the Murray-Darling Basin in Australia – realizing the potential for environmental benefits?

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1. Australia and the Murray-Darling Basin

The Australian Federation

The Commonwealth of Australia is a Federation of six States and two Territories. The Murray Darling Basin region covers more than 1,000,000 square kilometers (14%) of Australia, lying across much of five jurisdictions. Nearly 1.5 million hectares of land are irrigated from the rivers and tributaries of the Murray-Darling Basin, or 71% of total irrigated crops and pastures in Australia[2]. The River Murray is one of the two major rivers of the Basin and, at 2530 kilometres, is the second longest river in Australia, commencing in the Snowy Mountains of New South Wales and meeting the sea on the southern coast of South Australia.

The Murray-Darling Basin Agreement

The water resources of the Murray and Darling rivers have been the subject of inter-jurisdictional water sharing agreements (ratified by legislation) since about 1915. The current Murray-Darling Basin Agreement was signed by three state Governments and the Commonwealth in 1992. The forth State, being the uppermost region of the Basin, joined as a party in 1996, and the Australian Capital Territory in 1998.

The current Agreement covers natural resource management within the Basin as well as river regulation. Decisions as to works and measures to be undertaken to fulfill the Agreement are made by a Council of relevant Ministers representing each jurisdiction. Advice is provided to the Council by the Murray-Darling Basin Commission (MDBC), which is serviced by a central office.

2. Trade in rights within States and across the Basin - Capping resource availability

In 1997, jurisdictions agreed to 'cap' their allocations for consumptive use from the system. The Cap formed a Schedule to the Agreement, and is in the process of being implemented by each State.

States are at different stages with the implementation of the Cap. Queensland, for example, is yet to reach full allocation or to redefine existing rights as statutory property rights under new legislation. Victoria and New South Wales are also in the process of defining rights, and coming to terms with a possible over-allocation. South Australia (SA) has fully implemented its Cap, and in fact has made no new allocations from the River Murray since the early 1960s, it having been recognized that the river had reached its limit in terms of taking for consumptive use.

[1] The assistance of Mike Smith of the South Australian Department for Water Resources is gratefully acknowledged
[2] 1992 figures

The capping of resource availability in the River Murray has lead to active trade in water rights, both within States and, as a result of water trading rules implemented by the MDBC[3], between individuals across State borders.

In order to both function effectively and to achieve environmental benefits, or at least avoid environmental harm, a water trading market requires more than a cap on resource availability (where new demand is supplied only from within existing rights). Other requisites include a cap that reflects the sustainable allocation limit, well-defined property rights in the water entitlement and appropriate use rules reflective of the environmental effects of the use of water in particular locations.

3. Defining the property right

An essential prerequisite to trading in water rights is adequate definition of the rights as a form of property separate from real property (ie, separate from title to land).

All jurisdictions in the Basin have now introduced legislation which will achieve the necessary definition of rights. By way of example, SA's *Water Resources Act 1997* (WRA) was the first to sever the old property connection between land and water, clearly stating that water licences are personal to the holder, and are not linked to land title. Under the WRA "*a licence (including the water allocation of the licence) is personal property vested in the licensee and will pass to another person under Division 3* [which deals with trading of licences] *or…in accordance with any other law for the passing of property*". Consequently, licences are treated in many ways similar to real property[4]. Licences under the WRA are fully transferable, permanently and temporarily, although trade may be restricted by the provisions of a statutory water management plan to ensure that environmental impacts are properly managed.

By contrast with intrastate trade arrangements, *interstate* water trading involves a complex adjustment of rights between States under the Murray Darling Basin Agreement, to reflect the water traded between individuals.

Part of the complexity of interstate trade arises from the different levels of security of licences in each State. These differences reflect the conservative or speculative water allocation philosophy adopted by the respective States, the extent to which water rights are supported by the availability of large water storages, the location within the catchment and climatic conditions. SA River Murray supply is highly secure, as SA, being the down stream State, has the benefit of all major storages and tributaries within the Basin system (and the State has taken conservative approach to water allocation). Other States' water rights are much less secure.

To manage these differences, the interstate trading system presently operates only in a restricted 'pilot' area, and only in respect of each jurisdiction's highest security water rights. Plans are underway to extend interstate trade to a wider variety of water rights, but exchange rates reflecting the different levels of security of supply will first need to be developed.

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[3] Through Schedule E of the Agreement

[4] For example, the Minister is required to maintain a register of licences, to include endorsements of third party interests

4. Environmental effects of trade

The extent to which trade has had an overall positive or neutral environmental impact is subject to debate.

Recent reviews on effects of trade

Two recent reviews on water trading in Australia have been carried out: *National Approach to Water Trading* (May 2001) and *Interstate Water Trading: A Two-Year Review* (December 2000).

Both reviews note that generally, trade does cause water to be used for higher value uses, and to move downstream. The *Two Year Review* notes that the pilot interstate trade project allowed 51 trades involving 9.5 GL of water to move across State borders, and that in net volume terms, more than 90% of this water moved to SA. There are a number of reasons for this - SA, the most downstream State, has a climate ideal for permanent, high-value plantings such as olives, citrus, almonds and, more significantly, grapes for the wine industry. SA is also the driest State, has the smallest water allocation for consumptive use and produces the highest value crops per volume of water consumed. The consequent preparedness to pay a higher dollar value for water increases the likelihood that interstate trade will see water move into SA, and is generally reflected in an equal preparedness to invest in infrastructure that will see the water used as frugally as possible.

The *Two Year Review* notes that the environmental flow impact of inter-state water trading has probably been positive, although the total volume of trade has been so small that it is difficult to measure. However, the *Review* also notes that "from a salinity perspective and in the long-run, inter-state trading can be expected to have a negative impact on river salinity. Most water is being transferred to South Australian land that has not been previously irrigated with the consequence that river salinity can be expected to increase."

Regulating the market to modify environmental impacts

Attempts can be made to force the market to reflect the true costs of water use through trading rules which attempt to internalize environmental costs. These include the use of 'exchange rates', conditions on transfers, and licence conditions relating to place and manner of use.

- *Exchange rates*

  The MDBC interstate water trading rules incorporate two types of exchange rates, with a third in the process of being developed. The first exchange rate is applied to maintain the integrity of the 'Cap'[5]. The second exchange rate attempts to make the market reflective of some of the environmental impacts of trade. A reduction in the actual volume of water that can be taken is applied to transfers upstream in recognition of decreasing security of supply (the higher the extraction point, the fewer tributaries and headworks are available to supply the allocation). For example, rights being traded upstream of the junction of the Murray and Darling rivers are

[5] The Cap limits water use. When trading water allocations, care must be taken not to allow actual use to increase. Further explanation and application of the Cap and its associated exchange rate is complex and not further discussed here.

reduced by 10% (or attract an exchange rate of 0.9). In theory water traded downstream should therefore result in an increase in the volume that can be taken due to increased security. However, to be conservative and offer some environmental benefit, the maximum volume that can be taken is 100% (or the exchange rate has been set at 1.0). As the pilot interstate trading zone increases in geographical extent, allowances will also have to be made for in-river transmission losses or gains as water rights are transferred over large distances.

The proposed new exchange rate is planned to facilitate interstate trade over a greater variety of licence-types by creating the equivalent of a 'euro' in water rights to accommodate the different definitions of water rights and security levels between States.

- *Transfer conditions*

Conditions attaching to transfers to individuals are a matter for State legislation rather than the MDB Agreement. For example, the SA WRA requires licence transfers to be assessed in accordance with the relevant statutory water allocation plan, which sets out environmental water requirements and prescribes allocation and trading rules to protect those environmental needs. The State of Victoria uses trading rules to prohibit trade into high salinity impact zones.

- *Use conditions*

States also use a variety of mechanisms to impose conditions on the use of water. In SA, an "irrigation and drainage management plan" is imposed on the traded licence, and sets out a licensee's commitments to the use and management of the water and disposal of drainage reflecting local soil types conditions and proximity to the river.

So-called 'zero impact agreements' have also been developed in SA to the extent that a licensee has been required to establish a trust fund to cover the development's future salinity impacts. The agreement recognises the fact that even with best practice irrigation management, the development is still likely to negatively impact on the river in 20 or 30 years. By that time, the trust account will have accumulated sufficient funds to account for impacts, for example by construction of a salt interception scheme.

Trading water outside of the Basin

Real environmental benefits have been realized with the trading of water rights out of the Murray Darling Basin itself. A government owned pipeline is being used by third parties to transport water from River Murray licences to the Barossa Valley (within SA but outside of the Basin) for irrigating high-value wine-grapes. Using River Murray entitlements in the Barossa Valley maximizes their value without the associated salt loads returning to the River. The high value placed on water by the Barossa Valley growers means interstate water is being bought for this purpose, with additional environmental benefit as downstream environmental flows are increased as the water is removed from the lower reaches of the Murray rather than from NSW or Victoria.

5. Current challenges for 'environmentally effective' trade

The extent to which trade can achieve environmental benefits clearly depends on two elements:

- The extent to which caps on allocations, including the Basin-wide Cap under the Agreement, accurately reflect the sustainable allocation limit for the system for consumptive use. In some circumstances a cap on allocations may need to be reduced through a reduction of consumptive entitlements, which can in fact stimulate trade. This can result in water moving more quickly to higher value uses, and reducing the financial impact of the reduced entitlement.[6]

- The extent to which salinity impacts of use can be managed. The *Two-Year Review* notes that environmental impacts will be addressed through the new Basin Salinity Management Strategy amongst other initiatives, to ensure that salinity impacts remain within acceptable levels. The *Review* concludes that "if adequate arrangements are put in the place, then the long-run net effect of recent trades could be neutral."

The experiences of the Murray Darling Basin may have application to the many other circumstances where different jurisdictions find themselves looking for effective ways to share and manage the same water resources.

References and resources

Murray-Darling Basin Agreement 1992 (follow links from www.mdbc.gov.au)
A National Approach to Water Trading, High Level Steering Group on Water, May 2001 (from www.environment.gov.au)
Inter-state Water Trading: A Two-Year Review CSIRO, December 2000 (Young et al, for MDBC, also from www.mdbc.gov.au)
National Competition Policy (Australia) – Water Related Reforms (1995)

[6] See *A National Approach to Water Trading*, paragraph 7.4.1