

Workshop on Mainstreaming Environmental Water Law at the University of Melbourne, 14 October 2013

Topic 1: Structural issues and the “big picture”: What institutional mechanisms and legal status can and should we provide for environmental water as a “partner” in water use?

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Evolving institutional mechanisms for managing environmental water

The institutional mechanisms for managing environmental water in Australia are evolving. Historically, environmental water management involved defining minimum passing flow requirements or end-of-system flows as rules within water sharing plans or on bulk entitlements (NWC, 2010). The limits of this approach for meeting the highly variable needs of the environment led to the establishment of environmental water reserves or contingency allowances which allow river operators more discretion over the timing and volume of releases (Schofield *et al.*, 2003) – for example, the Barmah-Millewa environmental water allowance, established by the Murray-Darling Basin Ministerial Council.

While these reserves are mostly still provided for as rules in water sharing plans, in recent years market-based mechanisms for acquiring environmental water have grown in significance (Docker and Robinson, 2013). Two such examples are The Living Murray initiative, an intergovernmental agreement to recover 500 GL of water through irrigation efficiency improvements and direct purchasing for use along the River Murray; and Riverbank, a fund set up by the NSW Government to recover water for the environment through direct purchases from willing sellers in priority catchments.

Siebert *et al.* (2000) and Garrick *et al.* (2009) explore the policy and regulatory requirements to enable market transactions for the environment with the latter highlighting two of the key conditions as a cap on water rights so that scarcity exists and recognition of the environment as a legitimate user so that the transfer of property rights to the environment does not lose the underlying priority of the right. Both conditions are central to recent water reforms in the Murray-Darling Basin. In accordance with the National Water Initiative (NWI) (NWC, 2004), under the *Commonwealth Water Act 2007* and the Murray-Darling Basin Plan (Commonwealth of Australia, 2012) legally enforceable sustainable diversion limits result in a reduction in consumptive use (increasing scarcity) and the Federal Government’s acquisition programs (buyback and investment in irrigation efficiency) ensure the environment is a legitimate user with transferable property rights (Docker and Robinson, 2013).

The *Water Act 2007* also established the Commonwealth Environmental Water Holder (CEWH) as an independent statutory position to manage the Commonwealth’s environmental water holdings. The holdings consist of water entitlements that were previously used for irrigation. These entitlements retain the characteristics they had prior to purchase, including a right to a share of the resource

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through annual allocations and the obligation to pay statutory fees and charges. The development of institutional arrangements at the Federal level has been complemented by developments at state level. For instance, through amendments to its *Water Act (1989)* the Victorian State Government established a Victorian Environmental Water Holder (VEWH) to manage environmental water planning and use in that state, with one of its principle functions in the Murray-Darling Basin to coordinate arrangements with the CEWH and The Living Murray initiative. For further information on the full range of environmental water holders see O'Donnell (2013).

A key difference between these more recent developments and earlier market-based approaches is that the latter have been provided with a greater degree of independence from Government decision makers. Both the NSW Riverbank Program and the Living Murray program are ultimately subject to Ministerial decision-making, whereas the CEWH and the VEWH operate somewhat more at arm's length. In the case of the CEWH the Minister or the Secretary of the Department has the power to direct on water use but not on the trade of water or water rights. Any direction must be reported in the CEWH's annual report which is given to Parliament and to date there have been no directions given (CEWO, 2013). The VEWH can be given directions by the Victorian Environment Minister but not relating to either a particular trade or a particular water use (Water Act, 1989).

Some key features of environmental water holders

A defining feature of environmental water holders as they presently exist is that for the most part these entities manage entitlements that have the same characteristics as similar entitlements used for irrigated agriculture. This means that the property right remains transferable, thereby maintaining its value, and positions the environment as a legitimate user of the resource with the same rights and obligations as other users.

While the core characteristics of the entitlements remain the same, the institutional framework that gives effect to those rights is not necessarily static. The rules, regulations and developed practice in the Murray-Darling Basin have evolved over time largely to enable irrigation. It is therefore important to distinguish between the core characteristics of the entitlements, and the characteristics of the institutional framework in which those entitlements exist. The former includes the characteristics which provide for the underlying right of the entitlement holder, while the latter includes the rules, procedures and operating environment which govern how that right can be exercised. To maintain the security of the underlying property right, the core characteristics of the entitlements should remain (consistent with paragraph 31 of the NWI (NWC, 2004)):

- Statutory and perpetual
- Exclusive
- Tradeable
- A share of the consumptive pool
- With the same reliability/value as like entitlements
- Enforceable and enforced
- Subject to the same institutional framework as 'like entitlements'

The institutional framework that gives effect to these rights includes the rules that govern:

- Fees and charges
- Allocation announcements
- Water access arrangements and restrictions
- River operations practice
- Carryover and use provisions

- Trading arrangements and restrictions

While the obligation to be subject to the same rules as those with like titles is appropriate, for the environment to be a legitimate partner those rules need to be ‘fit for purpose’ with regard to the needs of all entitlement holders. This may mean that over time rules will change to adequately reflect the needs of different entitlement holders, irrespective of their particular business model or desired use of the water. For example, different carryover provisions might provide an entitlement holder with a range of options, some of which might be more useful to an environmental manager and others more useful to an irrigator, but ideally all entitlement holders would have the same capacity to use the provisions of most benefit to them.

Another important feature of environmental water holders is that for the most part they do not actually manage the physical delivery of the water. As with irrigation entitlement holders, when deciding on a particular use of water they place orders for water deliveries with state government water authorities. It is then government infrastructure operators (e.g. Goulburn-Murray Water in Victoria, State Water in NSW or the Murray-Darling Basin Authority on the Murray) who manage the physical release of water from storage. As for consumptive use, orders are delivered within existing operating rules and procedures that are designed to minimise impacts on third parties. These rules and procedures can limit the environmental benefit that can be achieved. For this reason the Basin Plan (Commonwealth of Australia, 2012) requires the development of a Constraints Management Strategy in order to identify where limitations such as these occur and what can be done about them.

Environmental water holders exist within a collaborative multi-layered governance structure with a range of actors operating at local, regional and basin scales (O’Donnell, 2013). As described in Banks and Docker (2013), within the Murray-Darling Basin this involves local environmental water managers such as Catchment Management Authorities, often with the involvement of local advisory groups, state government water and environment agencies that are not necessarily the same and which are focused on regional priorities, and at the basin-scale, the Murray-Darling Basin Authority as planning and regulatory agency and the CEWH as determinant of environmental water use, both with a focus on the environmental watering priorities for the basin as a whole and ensuring outcomes in the national interest. As part of the Basin Plan, the environmental watering plan seeks to coordinate the actions of all of these entities, by providing a common set of long-term objectives and targets, a planning framework, and principles both for determining priorities and for undertaking environmental watering.

New relationships between the environment and consumptive use

Market participant

Environmental water holders have been established as market participants. This means they have the capacity to engage in the water market to help achieve their objectives. Such a flexibility mechanism is important as it is expected to enable greater capacity to achieve optimal outcomes over time. By allowing the transfer of water from one user to another, water markets are expected to facilitate efficient outcomes. Figure 1, adapted from Horne *et al.* (2010), demonstrates how this might occur.

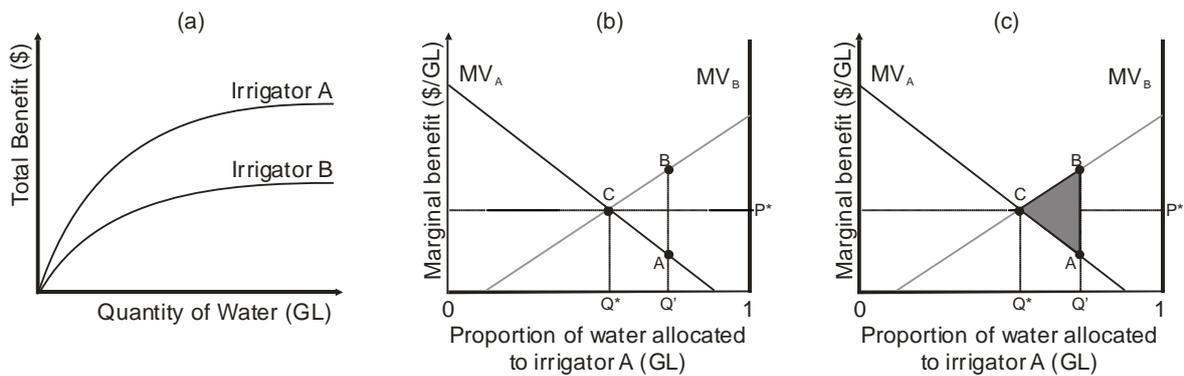


Figure 1: Fundamental concepts of a water market and the efficient allocation of water between two users.

In Figure 1(a) two irrigators derive different total benefits from the use of water. Their marginal benefit functions, which are the derivative of the total benefit curves, represent the value of each additional unit of water. In both cases, these irrigators face diminishing marginal benefits. An efficient allocation occurs where their marginal benefit curves intersect (point C). At this point no further allocation can occur without making one irrigator worse off. At this point the allocation is considered efficient (Freebairn, 2003) and on the Pareto frontier. If the initial allocation were at Q' in Figure 1(c) then both would benefit from a transfer of water from irrigator A to irrigator B. If the market moves from Q' to Q^* then the net social gain is equal to area ABC. This is based on the assumption that each irrigator acts rationally to maximise profits.

In conceptual terms this model can apply equally to the relative allocation of water between consumptive and environmental uses. Taking it a step further, one can easily see how it might apply to competing environmental uses where an efficient allocation will occur where the environment's marginal benefit curves intersect. That is, no allocation to alternative environmental use can make the overall net social benefit greater. Horne (2009) illustrates this by describing the trade-off between, for example, a winter high flow and a summer low flow. To maximise social gain, water should be distributed between each flow type such that marginal environmental values are equal.

A true environmental demand curve would reflect society's willingness to pay for the environmental outcome. Valuing (non-marketed) environmental goods and services is hampered by the complexity of ecological systems (Harwood and Stokes, 2003; Chee, 2004). Techniques for economic valuation of the environment suffer criticisms that they do not take adequate account of uncertainty and irreversibility, discontinuities and thresholds, nor adequately consider the issue of substitutability and time preference (Fisher and Krutilla, 1974; Chee, 2004). That said, one might consider that the Australian community have, through the democratic process (in 2007), expressed a willingness to pay for environmental outcomes in the Murray-Darling Basin of at least \$8.9 billion – not to mention previous (e.g. Riverbank and TLM) and subsequent investment commitments.

This investment allows an equilibrium point to be determined between consumptive and environmental users (and reflected in sustainable diversion limits). However, as environmental demands (and irrigation demands) are constantly changing both temporally and spatially, the optimal allocation between the environment and irrigation must also change and this is where environmental water holders can play a role through the water market (Horne *et al.* 2011), as rational actors seeking to maximise environmental outcomes; counterparties to irrigators who are rationally maximising profits.

The development of environmental water holders rather than rules in water sharing plans therefore means that the environment interacts with consumptive users on a transactional basis: two parties

entering into a mutually beneficial arrangement. As this relationship dynamic develops there is potential for it to support long-term policy sustainability around an efficient allocation of resources within the Murray-Darling Basin.

Water service customer

Environmental water holders within the Murray-Darling Basin have become the largest single owners of water entitlements. That means they are also the biggest customers of (state) water service providers, an important shift in the relationship dynamics in the water sector. Water authorities must now serve both consumptive users and environmental users in a way they have never had to in the past, with irrigators and environmental water holders having capacity to develop a relationship as peers rather than adversaries. Both have a common need for good service and value for money from the fees and charges each pays, and a need to hold their service provider to account. As the largest customer and government agency, the potential to advocate for services that benefit all users is increased.

This evolving relationship is evident in the CEWH's participation on customer service committee for State Water in NSW and in its submissions to various water authority reviews – e.g. Goulburn Murray Water and State Water tariff reviews. No longer is the environment an interested observer through environmental groups and others providing comment from the sidelines. Through environmental water holders, the environment is now sitting around the table, inside the room as a partner in water delivery.

Mixed institutional arrangements

While new institutional arrangements for environmental water management have emerged, the old arrangements are still prevalent. Indeed most environmental water still exists as rules-based water, and this will remain the case even at the conclusion of the Australian Government's acquisition programs in the Murray-Darling Basin. Entitlement managers will need to work with and in conjunction with environmental flows provided through rules and triggers in water sharing plans. This may mean that over time the management of entitlements begins to resemble more and more closely, rules-based water, with 'standing orders' and long-term agreements between water holders and river operators in place to govern the circumstances in which environmental water is delivered. Such arrangements would take advantage of the quick response times and conjunctive use of different types of water for overall benefit, while maintaining the fundamental property right of the entitlement itself.

Despite their relatively small share of the environmental water pool, environmental water holders have brought unprecedented transparency to environmental water management. When environmental water provided only as rules in water sharing plans or simply as whatever was left over after consumptive use, it has often been difficult to ascertain exactly how much, when and for what purpose environmental water was used (NWC, 2011). Environmental water holders are mostly publicly identifiable individuals (e.g. the CEWH) or boards (e.g. the VEWH) with requirements to report on their holdings, use and outcomes to Parliament (and therefore the public). They are subject to the questioning of Senate Committees and the oversight of Ministers. Such openness should be an important development in helping to reduce transaction costs associated with determining an efficient allocation between environmental and consumptive use over time.

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