

# The Inter-Sectoral Implications of Securing Our Water Future Together

Recent Water Reforms in Victoria, Australia

Lin Crase, La Trobe University, Australia

Brian Dollery, La Trobe University, Australia

*Abstract: Water resource allocation has become a critical issue from an environmental, productive and political perspective. The release of the Victorian Government's White Paper Securing Our Water Future Together in 2004 and the Premier's opening stanza claiming that "in Victoria water is at the top of our agenda" is testament to the prominence of these issues. However, whilst the modifications proffered in the White Paper address some of the historical 'misuse' of the resource, there are also grounds for questioning the efficacy of elements of the reform agenda. More specifically, the notion of 'sharing the pain' of reallocation across all sectors of the community is evident in the reform agenda with specific reforms targeted at urban users, in spite of their relatively modest impact on extractions. This paper specifically explores the impacts of water reforms in urban contexts and contrasts them with the proposed adjustments to irrigated agriculture. The paper argues that the reforms do not meet the narrowly defined efficiency criteria applied by economists but might conceivably be justified on alternative grounds.*

Keywords: Water reform, Water-use efficiency, Water markets

## Introduction

**A**USTRALIANS **OFTEN** **ACKNOWLEDGE** that they live in the driest settled continent on Earth. However, overt community acceptance of the relative scarcity of the nation's water resources is a relatively recent phenomenon (see, for instance, Tippet and Cauchi 2004, p.6). Moreover, learning to cope with water shortage has now assumed paramount political, social and economic importance.

Historically, Australia's water resources have been seen as a factor of production to be harnessed in both agricultural and industrial contexts particularly in the context of regional economic development. Water resources and their allocation were thus intrinsically tied to regional economic, social and strategic objectives (Langford-Smith and Rutherford 1966). This view ostensibly informed water resource policy in Australia until the 1980's whereupon limited consideration began to emerge about the true opportunity cost of water usage and the potentially deleterious effects of specific uses (Watson 1990, p. 11)

Since the 1980's the 'development' hypothesis underpinning Australia's water use has been supplanted by a water 'management' paradigm consistent with the concept of a mature water economy. This mature water economy is characterised by "...inelastic supply of 'new' water and the need for expensive rehabilitation of aging

projects" (Randall 1981, p. 195). The water management regime congruous with a mature water economy also requires policy makers to broaden the scope of water policy objectives to include economic efficiency, sustainable development and ecological sustainability (Watson 1990, p. 12). This has been reflected in the increasing complexity of the allocation of water resources to multiple and competing environmental and economic objectives and manifests itself in the myriad of legislative reforms to the Australian water industry.

In Victoria, the most recent proposed reforms have been articulated in the release of the Victorian Government's *White Paper Securing Our Water Future Together* in June 2004. Moreover, the Premier's opening stanza claiming that "in Victoria water is at the top of our agenda" (Department of Sustainability and Environment [DSE] 2004, p. 3) is testament to the prominence of water issues. However, whilst the modifications proffered in the *White Paper* address some of the historical 'misuse' of the resource, there are also grounds for questioning the efficacy of elements of the reform agenda. More specifically, the notion of 'sharing the pain' of reallocation across all sectors of the community is evident in the reform program with specific measures targeted at changing the behaviour of urban users, in spite of their relatively modest impact on extractions. This paper specifically explores the impacts of water reforms in urban contexts and



INTERNATIONAL JOURNAL OF ENVIRONMENTAL, CULTURAL, ECONOMIC AND SOCIAL SUSTAINABILITY, VOLUME 1, NUMBER 5, 2005/2006

<http://www.Sustainability-Journal.com>, ISSN 1832-2077

© Common Ground, Lin Crase, Brian Dollery, All Rights Reserved, Permissions: [cg-support@commongroundpublishing.com](mailto:cg-support@commongroundpublishing.com)

contrasts them with the proposed adjustments to irrigated agriculture. The paper argues that the reforms do not meet the narrowly defined efficiency criteria applied by economists but may be justified on alternative grounds. In addition, the paper proffers an explanation of the conception of 'value' and then explores the underlying hypothesis that effective reform will move water to its highest value.

The paper itself is organised into five main parts. In section two we briefly review the policy intent of the *White Paper* and position the proposed reforms in the context of the national water reform agenda. The relative impacts of the proposed reforms on the environmental, urban and irrigation sectors<sup>1</sup> are highlighted in section three accompanied by a brief overview of the likely direct impacts from a 'water-saving' perspective. Section four employs these comparisons to comment on the hypothesis that water resources should move to its 'highest value use' under the reforms and thereby be consistent with the underlying economic framework. Section five contains some brief concluding remarks.

### **The Public Policy Context of 'Securing Our Water Future Together'**

Water reform is not new to Victorians. Commencing primarily in the 1980's in response to the paradigmatic shift towards a water management ethos, the reform process has only recently gained prominence within the broader community. However, to fully appreciate the type and extent of change embedded in the *White Paper* it is important to acknowledge the processes and institutions that circumscribe the present reform milieu at the national and catchment levels.

### **The Victorian Setting**

Water use in Victoria presently lies within the scope of the Water Act 1989 and its most recent amendments embodied in the Water (Irrigation Farm Dams) Act 2002. Irrigation is by far the most significant extractive use of water in Victoria. Whilst aggressive in its development of irrigation prior to federation, the state presently employs a relatively conservative water allocation system compared to others, like New South Wales. In most instances irrigation activity is arranged under a system of bulk entitlements<sup>2</sup> assigned on a district level. Individual irrigator's water entitlements are subsequently referred to as 'water right' and 'sales water'. The first category is relatively secure and available in all

but the driest seasons whilst 'sales water' is less secure and depends on the amount of water in storage, less a provision for the following years 'water right'. In addition, Victorian irrigators cannot carry forward unused water right to the following season (Tan 2002).

Urban water use in Victoria falls primarily within the scope of the same Act, with most urban water authorities holding bulk entitlements. In this context urban users potentially 'compete' for the resource against irrigators' demands. Trading rules have been established although most trade occurs within the agriculture sector rather than between sectors.

The urban water sector was the subject of significant reforms during the 1990's under the Kennett government. For instance, in 1995 the metropolitan water sector was split into wholesale and retail components with Melbourne Water currently selling water to five urban retail businesses. Similarly, the structure of the non-metropolitan urban sector was radically altered at this time. In the early 1970's the Victorian non-metropolitan water industry comprised 370 water trusts, sewerage authorities and local councils, each operating independent water and sewage services. As a result of a series of amalgamations in the 1990's, water and wastewater services are now provided by only 14 regional urban water authorities.

In addition to the significant reforms of the 1990's, several important initiatives in the new millennium are noteworthy. In 2002, the Victorian Government released its River Health Strategy which established targets for environmental enhancements in the form of flow regimes and the like. Later in the same year, the Victoria Water Trust was established to promote water recycling, increase the efficiency of irrigation and promote water conservation in urban settings. In 2003, regulatory oversight of the water sector was assumed by the Essential Services Commission and in August of that year the *Green Paper* that preceded '*Securing our Water Future Together*' was released.

In sum, the underlying tenor of earlier Victorian reforms has been congruous with the water management ethos that supplanted the development paradigm. The changes in Victoria have also been broadly sympathetic with the circumscribing reform agenda occurring at the catchment and national levels.

<sup>1</sup> To simplify discussion we have chosen to treat the environmental demands on water resources as a 'competing user'. In this context we employ the term 'sector' to describe the threefold ramifications of altered water allocation systems. In doing so, we acknowledge that our framework is essentially anthropocentric in nature and therefore carries the usual caveats associated with this approach.

<sup>2</sup> Prior to the *White Paper* it was envisaged that most uses would be converted to bulk entitlements but this has taken longer than expected. The most recent reforms restate the commitment to complete this process (see, for example, DSE 2004, p. 22).

## Catchment Setting

Much of Victoria is situated in the Murray-Darling Basin which spans several Australian States and Territories (see, Figure 1). Coordination of the Basin's resources resides with the Murray-Darling Basin Ministerial Council (MDBMC) which presently comprises government ministers from NSW, Victoria, South Australia, Queensland, the Australian Capital Territory and the Commonwealth. The operational arm of the MDBMC is the Murray-Darling Basin Commission (MDBC). Both organizations owe their formation to the Murray-Darling Basin Agreement which is set out in the Murray-Darling Basin Act dating from 1914. The Agreement arose from differing development priorities amongst the states; Victoria and NSW seeking to develop the resource for irrigation whilst South Australia saw the River Murray as a transport route (Clark 1971). The three basic principles that underpin the agreement have remained largely unchanged since the agreement's inception; namely, river flows at Albury are equally apportioned to NSW and Victoria, water from the various tributaries of NSW or Victoria is retained by those states and NSW and Victoria guarantee a minimum flow to South Australia (Quiggin 2001, p. 72).

Significant environmental problems began to emerge in the 1980's largely as a consequence of over-allocation and excessive extractions. In 1992 a 'new' agreement was ratified which included Queensland as a signatory whilst the Australian Capital Territory was added in 1998 (MDBC 2000). The new agreement placed far greater emphasis on sustainable use of the water, land and other resources of the Basin (see, for instance, MDBC 2000) and set the foundation for the audit of water extractions in 1994. As a consequence of this audit an interim "cap" on water diversions at 1993/94 levels was imposed in 1995 after the deleterious impacts on riverine environments were clearly identified (DLWC 1997, p.1). In July 1997 the MDBMC agreed to maintain the cap which implies that there are no 'new' extractive entitlements.

Importantly in the context of the present Victorian *White Paper*, the MDBMC also released its 'Living Murray' discussion paper in July 2002. This document was designed to "start community discussion about whether or not water should be recovered from water users for the environment" (MDBMC 2002, p. 29) and proposed 350, 750 and 1500 gegalitres as reference points. The outcome of these discussions was a decision to take a 'First Step' and return 500 gegalitres, primarily with the aim of restoring the health of several iconic sites along the River Murray.

Concurrent matters considered at the National level cannot be divorced from the recent resolution adopted by the MDBMC.

## National Setting

Although the property rights to water continue to be retained by the states, water reform entered the national arena with the signing of the Council of Australian Governments (CoAG) Agreement on Water Resource Policy (or Water Reform Framework) in February 1994, and later the Competition Principles Agreement in April 1995. Amongst the original ingredients of the Framework was the requirement to develop a system of water allocations that recognized the legitimate demands of the environment and simultaneously broke the nexus between land and water titles, thereby facilitating water trade. In addition, the original Framework emphasized separation of resource management, regulatory and service delivery functions, full cost recovery and pricing reforms that encompassed two-part tariffs for urban users (National Competition Council [NCC] 1998, p.3). Subsuming the water reform process within the ambit of National Competition Policy provided clear and significant financial incentives for states and territories at that time in the form of a promised per capita share of around \$16 billion in transfers from the Commonwealth over eight years to July 2006 (NCC 2003).

In August 2003, in the midst of the deliberations by the MDBMC over the *Living Murray*, CoAG announced that agreement had been reached on a new National Water Initiative. The core elements of this program were the development of nationally compatible water entitlements, the establishment of an inter-state functioning water market, arrangements for integrating management of environmental water (including using water markets), enhanced measures to develop a water accounting framework and accelerated urban water reforms. A critical component of the National Water Initiative announcement and its relationship to the *Living Murray* was that member jurisdictions of the Murray-Darling Basin revealed they had settled on allocating \$500 million over the next five years to address the declining health of the Rivers in the Basin, particularly the Murray River (CoAG 2003, 1).

## Policy Intent of the white Paper

In sum, changes to water resource management over the previous two decades reflect a growing recognition of the deleterious consequence of the exploitative development that had occurred since white settlement. Moreover, the Australian federal system of government and the interconnectedness

of water resources across state boundaries has given rise to a complex set of institutional arrangements attempting to deal with these extant environmental ills. It is against this background of national and catchment policy reorganization, that the most recent reforms proffered by the Victorian Government should be considered.

Consistent with earlier policies and cross-jurisdictional undertakings, the *White Paper* emphasises the role of enhanced stewardship to cope with the range of problems confronting state water resource managers. Six overarching policy priorities are evident in the document. Firstly, the *White Paper* emphasises the development of allocation and entitlement systems to enhance certainty whilst also addressing the environmental impacts of over-allocation. Secondly, an Environmental Water Reserve is to be established to assist in the restoration of stressed rivers and groundwater sources. Thirdly, efficiency in irrigation practise is to be encouraged by unbundling water entitlements and enhancing the role of the water market, accompanied by greater attention to water efficient infrastructure. Fourthly, new measures to encourage water conservation in urban environs, including closer scrutiny of recycling, are to be adopted. Fifthly, new pricing policies are to be implemented in the context of water and sewerage services. Finally, the document provides indicative comments on enabling legislation, regulatory frameworks, targets, strategies and funding arrangements and emphasises further institutional reform (DSE 2004; Anderson and Newton 2004).

One of the core themes of the document is that the 'pain' associated with adjustment should be shared universally. For instance, in his opening foreword, the Premier observes that "strategies will ensure that *we all play our part* in securing our water future together, as we grow as a state" (DSE 2004, p. 3 *emphasis added*). The distribution of the impacts of reform are addressed in the following section by considering environmental, urban and irrigation sectors.

## Sectoral Implications of Reform

### Environmental Ramifications

The Government's stated environmental aspiration is "to have healthy rivers, floodplains, estuaries and catchments" (DSE 2004, p. 38). Notwithstanding the difficulty of defining environmental health with precision, restoring sufficient flow to achieve

environmental outcomes is at the core of the reforms in the environmental sector. The principal mechanism for achieving this is the proposed establishment of Environmental Water Reserves for each of Victoria's river systems. The reserves would have legal status and be held by the Minister. Where over-allocation presently exists, the establishment of the level of each reserve is to be determined in a manner that recognises the role of adaptive management. Similarly, the precautionary principle is to be employed in the case of those rivers and aquifers not presently over-allocated (DSE 2004, p. 44-47).

Not surprisingly, the greatest challenge is to redirect water from current consumptive users to establish the necessary reserves in over-allocated systems. To this end the proposed reforms envisage re-allocating about 20% of what was formerly 'sales' water from irrigators. However, this is to be accompanied by reducing the attenuation on the remaining 80% of 'sales' water by conversion to a 'low reliability' but tradeable entitlement. Additional water resources to establish the necessary reserves are predicted to derive from practical restoration measures<sup>3</sup>, funding of water use efficiency in irrigation<sup>4</sup>, investing to reduce distribution losses, purchases through the water market, donations and the substitution of recycled water of suitable quality. Importantly in the context of our discussion in section four, the *White Paper* emphasises that a range of criteria are to be employed to establish the efficacy of measures to re-allocate water to the environment. For instance, in regard to the use of the water market the Government's "aware(ness) of the potential socio-economic side-effects" and its resolution to "as far as possible ...provide long-term, environmental, social and/or industry benefits" is acknowledged (DSE 2004, p. 49).

In some instances the Environmental Water Reserve will include a bulk entitlement component with three new bulk entitlements for the environment currently proposed in the *White Paper*. One of the advantages of these arrangements is that such entitlements can be temporarily traded and, given the arbitrage associated with such trades, should provide non-trivial funds for additional environmental enhancements. It is further envisaged that Catchment Management Authorities (CMAs) will be charged with the responsibility for managing the Environmental Water Reserve and transparent mechanisms put in place to account for the costs of servicing this sector via existing and new infrastructure (DSE 2004, pp.62-65).

<sup>3</sup> For instance, the decommissioning of relatively inefficient storages like Lake Mokoan is expected to deliver about 44,000 megalitres to enhance environmental flows in the Snowy and Murray Rivers (DSE 2004, p. 55)

<sup>4</sup> Water savings in this instance would accrue to the Environmental Water Reserve on the basis that 'those who fund the water savings keep the water'. This issue is given further attention in section four.

The proposed arrangements are expected to supplement existing and future joint undertakings with New South Wales and Federal governments; particularly the commitment to return water to the Murray and Snowy rivers.

### Irrigation Reforms

Irrigation presently accounts for about 77% of consumptive water use in Victoria (DSE 2004, p. 17). Accordingly, efforts to establish Environmental Water Reserves might, *a priori*, be expected to impact significantly on this sector. Under the existing Act, the 'right' component of an irrigator's entitlement cannot be altered within existing statutes without attracting compensation but the 'sales' component can be amended without compensation, should the Government wish to ensure consistency with the cap or to meet other claims.

The proposed measures in the *White Paper* will see significant changes to the structure of entitlements and expanded emphasis on water trade as a vehicle for driving greater efficiencies. The underlying premise of these reforms (and the changes at the national level) is that greater clarity and reduced attenuation of water property rights will realize a superior market outcome. Moreover, the altered structure of entitlements and the attendant market value of water should encourage investments in water-saving technologies and ultimately yield an environmental dividend (see, for instance, Crase et al. 2004).

The specific entitlement reforms from an irrigation perspective in *Securing our Water Future Together* would see water shares allocated that reflect water available for consumption (i.e. similar to existing 'water rights'), 80% of existing 'sales' water specified as a secure but low-reliability right, shares in delivery capacity articulated (e.g. channel capacity) and a license to use water on a site issued. In addition, it would be possible under the proposed regime for water shares to be held separately from land by non-irrigators, although total holdings are to be constrained to a maximum of 10% for any system as a purported safeguard against unfettered speculation.

The proposed changes to entitlement structures are forecast to yield about 120 gigalitres (as a consequence of the transfer of 20% of 'sales' water to the Environmental Water Reserve). An added 25 gigalitres is expected to accrue to the environment by investing \$50 million in upgrading and rationalizing distribution infrastructure in irrigation (DSE 2004, p. 73). Put differently, this additional

achievement is expected to occur at an average cost of about \$2,000 per megalitre.

The *White Paper*'s emphasis on the role of trade and market mechanisms extends to inter-state trade on the proviso that the other state involved in the exchange has the necessary regulatory and legislative mechanisms to allow water to also trade freely into Victoria. Moreover, the matter of stranded assets<sup>5</sup> is addressed in the proposed reforms by tying water delivery charges to land. This implies that those farmers who sell water will continue to pay for the enhanced value they enjoy by having the existence of the communal infrastructure (DSE 2004, pp. 78-80). Additional support for the role of the water market is to be provided by the establishment and maintenance of a public register for all water-related entitlements (DSE 2004, p. 70).

### Urban Reforms

In stark contrast to the approach taken to reform the irrigation sector, far less emphasis has been placed on market mechanisms as a vehicle for securing adjustments in the urban sector. The overarching theme in this sector is one of greater reliance on mandated and assisted behavioural change in the form of permanent water restrictions, incentives for adopting water-saving devices, education and the establishment of aspirational recycling targets. Importantly, and in the context of the discussion in section four, the administration of water conservation measures reside primarily with urban water authorities whose primary source of revenue is the sale of water and wastewater services.

Whilst the urban reforms acknowledge the environmental dimension of over-extraction, there is also significant emphasis on the need to accommodate future growth against a prospect of lower catchment yield due to climate change. Accordingly, the emphasis for this sector is on living within the present resource constraint since "new dams are not the solution" (DSE 2004, p. 95). In the context of Melbourne, an important additional justification for this approach is that new infrastructure "would take water from Gippsland or Goulburn Valley farmers who depend on irrigation for their livelihoods" (DSE 2004, p. 95). No similar comment on the livelihood of urban Victorians is proffered.

On the basis that the urban sector, particularly Melbourne, should make less profligate use of the resource, the *White Paper* elucidates several demand management mechanisms to reduce personal consumption from 423 litres per day to 360 litres. Amongst the most prominent of these measures is

<sup>5</sup> Stranded assets arise when some irrigators sell all their entitlement in a communal irrigation system leaving the remaining irrigators to carry a disproportionate share of infrastructure costs.

the introduction of permanent water saving measures or 'restrictions'. Whilst such measures are to be developed at a local level, common restrictions include prohibition of cleaning paved areas by hosing, daytime constraints on garden watering, compulsion to install trigger nozzles to hoses for garden watering and car washing and a requirement to upgrade automatic sprinkler systems with rain sensors. Some of the investments required to meet the individual water reduction targets attract rebates under the Water Smart Gardens and Homes Rebate Scheme introduced in January 2003. The *White Paper* urban reforms extend this scheme until 2006 and provide scope to assist not-for-profit organisations undertake similar investments.

In addition to constraining individual householder behaviour the urban reforms emphasise the need for future urban developments to accord with water-sensitive design. In essence, this approach seeks to achieve savings by modifying building practices, town planning schemes and plumbing standards (Anderson and Newton 2004, p.1).

In line with the effort to clarify entitlements in the irrigation sector, a significant urban reform involves the specification of entitlements for stormwater and recycled or reclaimed water. Whilst these arrangements raise the status of this form of the resource, the Government has emphasised the notion of 'fit-for-purpose' use. This has had the effect of excluding the possibility of substituting reclaimed water in potable supplies. The proposed state-wide target for recycling has been set at 20% by 2010.

Even though many of the reforms in the urban sector rely on regulation to achieve behavioural change, the *White Paper*, partially acknowledges the role of price in constraining demand by advocating inclining block tariffs to reward frugal water users. In addition, prices of urban water are to be adjusted to yield an 'environmental contribution' equivalent to 5% of the urban authority's existing revenues. Accompanied by a smaller and deferred contribution from rural authorities, this is expected to raise approximately \$225 million over four years and pay for many of the water-related initiatives.

## **Adjudging Inter-Sectoral Impacts and Addressing the Concept of Value**

### **The Economics of 'Value'**

To date we have considered the impacts of the proposed Victorian reforms from the perspective of three sectors; the environment, irrigation and urban users. In addition, we have contended that the overriding aim of reforms is to redistribute water, which had been previously over-allocated to extractive users, back to the environmental sector.

In light of the uncertainty that circumscribes the environmental impacts of reform and the acknowledged role of adaptive management, we use the remainder of this paper to comment solely on the relative impacts of reform on the irrigation and urban sectors. This offers useful insight to the Government's conception of value, which we review from an economic perspective in the first instance.

Economists are often accused of knowing the 'price' of everything and yet understanding relatively little of 'value'. This criticism emanates from several sources. Firstly, neo-classical conceptions of economic behaviour are predominantly founded on overt behaviour in a market setting. Accordingly, economics can often inform policy makers about what is bought, what is sold and how much is paid, but offers only limited insight into the motivations for that behaviour. Secondly, the observable behaviour in a market setting is itself plagued by numerous flaws. The expansive literature detailing market failures stands as testament to the limitations of this framework. Thirdly, the common metric used in this discipline is the dollar and, whilst applicable in a multitude of contexts, does not always denote of equal value to each individual.

Notwithstanding the limitations of adjudging the value of a policy change from an economic perspective, it does offer significant advantages for considering impacts. In many respects these advantages are simply the antithesis of the aforementioned constraints. More specifically, economists can arguably place greater faith in policy recommendations generated through observed behaviour than in those founded on expected reactions; by being cognisant of market failures economics can offer prescriptions to remedy inefficiencies, and; by using a simple metric it is feasible to make some (limited) comparisons across a variety of settings. This should not be taken to imply that the outcomes of an economic overview result in the immutable truth. Alternatively, the economic framework allows us to consider the social, environmental and political ramifications against threshold dollar values.

The conventional economic framework yields some significant guidelines to achieve the Paretian efficient allocation of resources, including water. The basic conclusion is that an efficient allocation arises when the marginal benefits and costs are equated across all alternatives and a redistribution of the resource from one user to another cannot be achieved such that overall welfare is enhanced. Put simply, the marginal cost of allocating a megalitre of water to the environment should be equal in both sectors to sustain a notionally efficient outcome. Even a cursory review would suggest that the proposed Victorian reforms fall well short of this

criterion and several instances of the economic anomalies contained within the document are highlighted below.

### Economic Paradoxes in the White Paper

As we noted earlier, one of the main tenets of the irrigation reforms is the use of market mechanisms to move water to higher value uses. Moreover, the underlying assumption in this sector is that individual irrigators will economise on water use as the market value of water increases, underpinned by enhanced property right arrangements. Notwithstanding the obscurity of the relationship between water use efficiency in irrigation and environmental returns (see, for instance, Crase et al. 2004), the assumptions applied to the behaviour of urban users appears to be substantially different to those pertaining to irrigators.

Whilst acknowledging the prospect of behavioural change via higher urban water prices, it would appear that the Government believes that urban behaviour cannot be trusted to the market and therefore requires supplementary bureaucratic and administrative constraint. Thus, the conception of value is shifted away from the economic domain when considering urban reforms. Put simply, instead of the market determining what represents a higher value activity (as in irrigation), the government has chosen to specify what behaviours are of greatest value to the community in urban settings. An urban individual may value their garden greatly and be prepared to move the resource to this perceived higher value use by paying extra, but they are largely constrained or prohibited from doing so<sup>6</sup>. By way of contrast, an irrigator can purchase water and move it to most uses without constraint<sup>7</sup>.

In addition to the apparent lack of faith in the market mechanism in urban contexts, the proposed reforms only partially allow the market to determine what constitutes higher value and to establish the temporal elements of value in irrigation. This occurs primarily because of the constraint on participation in the water shares market. Non-irrigators are constrained to owning no more than 10% of water shares in any system. Presumably, investing in water shares for 'speculative' purposes occurs because a given individual or entity assesses the future

discounted value of the resource to be greater than its current dollar value. Moreover, the constraint on non-irrigators assumes that irrigators are unable to make the same judgements or that their discount rates are markedly different from 'speculators'. It also implies that if irrigators have an alternative discount rate it brings superior benefits to the wider community. Put differently, this constraint on speculation hampers the capacity of the market to move the water to its highest value use over time. The caveat on speculation constrains the activity to those fortunate enough to have the status of irrigators – it does not stop speculation *per se*, it simply limits the number and status of those who are permitted to speculate.

An additional economic contrast can be gleaned from the relative costs of yielding water savings in each of the sectors. In section 3.3 we noted that a range of rebates are to be extended to urban users to encourage water saving behaviours. The *White Paper* also provides indicative data on the uptake and water impacts of those rebates between January 2003 and May 2004. These data are represented in Table 1 and adapted to provide an indication of the dollar value of achieving water savings<sup>8</sup>.

Two important trends appear in these data. Firstly, there is considerable variation in the costs of achieving water savings within the urban rebate scheme. For instance, the relatively modest water gains and generous rebate for dishwashers implies that each megalitre saved from this source has a 'value' to the government of about \$33,000. By way of contrast, water saved through shower roses occurs at a rate of only \$770 per megalitre. The second important feature of these data is the distinction between the average cost of accomplishing savings via the rebate scheme in the urban sector and the costs of achieving savings in the irrigation sector. In section 3.2 we noted that 25 gegalitres was expected to be yielded by rationalising and upgrading irrigation infrastructure at an approximate cost of \$2,000 per megalitre. Notwithstanding that urban savings relate to 'clear water'<sup>9</sup> and irrigation savings may not always be easily transferable to the urban environment, the average cost of achieving savings via the rebate scheme is at least 4 times that required to achieve much larger savings in the irrigation sector. In the case of the rebate for dishwashers, the

<sup>6</sup> It should be acknowledged that there is an extensive literature to attest to the difficulty of defining the concept of value with precision (See, for instance, Gramlich 1990; Mishan 1998).

<sup>7</sup> One extension of this view would see urban users provided with a notional allocation and being able to trade this to others if they were able to adjust their water use. The transaction costs of such arrangements are likely to prohibit their feasibility. Alternatively, increased emphasis on inclining block tariffs could achieve similarly 'efficient' incentives to modify urban behaviour.

<sup>8</sup> The original data provides some approximate estimates of the number and value of Flow Control Valves (Water Saver Kits). Due to the apparently arbitrary nature of some of the estimates and in the absence of any indication of the cost of provision, these data have been excluded from Table 1.

<sup>9</sup> This is the term used to describe potable supplies after treatment. In 2002-03 the average operating costs to generate a megalitre of clear water in Victoria was \$558, which includes the cost of raw water (Victorian Water Industry Association 2003 p. 79).

cost of achieving water savings is more than 15 times that which could be achieved through irrigation. Strictly from an economic standpoint, the

presumption that water should be reallocated equally from irrigation and urban users to the environment cannot be supported.

**Table 1: Urban Rebate Uptake and The Value per Megalitre of Savings**

Product	Rebate Amount (\$)	Rebates Approved	Estimated Total Water Saved (ML)	Total Cost (\$)	Cost/Foregone Value of Savings (per ML)
AAA Dishwashers	100	5,744	17.2	574,400	33,395
AAAA Washing Machines	150	13,666	218.7	2,049,900	9,373
AAA Shower Roses	10	1,932	25.1	19,320	770
Dual-flush Toilets	50	1,803	23.4	90,150	3,853
Greywater Permanent Septic Tank	500	115	2.9	57,500	19,828
High Pressure Cleaning Devices <sup>1</sup>	30	19,064	24.8	571,920	23,061
Rainwater Tank to Toilet System	150	117	4.0	17,550	4,388
Rainwater Tank	150	6,034	99.8	905,100	9,069
Water Conservation Audit	30	45	0.5	1,350	2,700
Rebates for \$100 Worth of Goods	30	15,141	75.7	454,230	6,000
Overall Total			492.1	4,741,420	9,635

<sup>1</sup> Adapted from DSE 2004, p. 102

An additional dilemma from an economic perspective relates to the timing and nature of the proposed environmental contribution. If we accept that price acts as a useful motivator to reduce consumption, applying a differential and delayed contribution to rural water authorities arguably belies the fact that 77% of Victoria's water resources are extracted for irrigation. Urban users will pay a higher contribution and sooner than most irrigators and yet this can only impact on 17 % of extractions.

### Additional Qualifications

In addition to the extant economic inconsistencies in elements of the *White Paper* there are several other matters that warrant consideration, most pertaining to the urban reforms. Firstly, the thrust to achieve conservation targets in urban environments is to be administratively assigned to urban water authorities. As we noted earlier, water authorities' revenues are derived from water sales which, conceivably, creates a conundrum from an institutional perspective. Are water authorities sufficiently motivated to achieve

conservation? Whilst urban authorities make some gains by encouraging conservation behaviour though deferring expensive capital projects, the trade-off between lost water sales and the incentive to promote water saving requires further exploration. This issue warrants urgent research.

Secondly, considerable emphasis in the urban reforms is placed on recycling and reclaiming alternative water sources. Even though such measures have intuitive appeal to many, the relationship between recycled water, stream flows and the environmental goals espoused in the *White Paper* are not well understood. For instance, expanding water reuse does not guarantee a reduction in water consumption *per se* unless such activities notably provide a substitute for existing functions; expanded use of reclaimed water might conceivably reduce return flows in some cases. Similar scenarios might also apply to the harnessing of stormwater. Again, research in this field would assist in clarifying the appropriateness of this policy response.



## Social and Political Considerations

Water policy does not emerge from a social and political vacuum dominated solely by economic considerations. The allocation of water in Australia has historically been associated with social policy and often took no serious account of the longer term economic (or environmental) consequences (Watson 2003). To imagine that the Victorian Government is blessed with a 'blank sheet of paper' is to ignore the institutional history that pervades water resource policy in Australia generally. Moreover, as Horn (1995) observes, to facilitate a redistribution from the few to the many will invariably entail significant costs since the intense preferences of the few provide a powerful incentive for rent seeking and the maintenance of the *status quo*.

Given the widespread acceptance of most of the reforms (Fyfe 2004), the earlier discussion should serve as a reminder of the 'value' of achieving change whilst maintaining socially and politically acceptable outcomes across several dimensions. The reforms may have significant deficiencies from an economic efficiency perspective, but their adoption is expected to make a non-trivial contribution to achieving an efficacious outcome for the majority of Victorians.

## Concluding Remarks

Water resource allocation in Victoria is undergoing continued and substantial reform. The reforms proffered in the *White Paper, Securing Our Water Future Together* are both consistent with the broader reform agenda and the water management paradigm that arises from a mature water economy.

Considered at a sectoral level the reforms promise significant, although hitherto uncertain, environmental gains. Extractive use is to be substantially modified to improve flow regimes and hopefully secure enhancements to riverine health.

Of particular interest is the contrasting approaches to achieving the reallocation to the environment that are evident in irrigation and urban sectors. In the case of the former, heavy reliance is being placed on the capacity of water markets to encourage the desired behavioural change. Alternatively, the urban reforms rest significantly on government intervention.

A review of the reforms across sectors reveals significant deficiencies from an economic efficiency perspective and apparent scope for welfare gains by reconfiguring the distribution of costs. However, to do so would ignore the non-trivial social and political events that circumscribe water policy in Australia. In essence, this may be as good as it gets in the medium term.

## References

- Anderson, G. and A. Newton, Victorian Government's White Paper on water, *Focus: Water*, June, 2004  
<http://www.aar.com.au/pubs/env/fowjun04.htm>, Accessed 13 th October 2004
- Clark, S., The River Murray question: Part 1 - Colonial days, *Melbourne University Law Review*, 8, 11-40, 1971.
- Council of Australian Governments, Communiqué, Canberra, CoAG, 29 August 2003.
- Crase, L., Pagan, P. & B. Dollery, 2004, Water Markets as a vehicle for reforming water resource allocation in the Murray-Darling Basin, *Water Resources Research*, 40, 1-10, 2004.
- Department of Land and Water Conservation (NSW), Water audit - implementation of the diversion cap in NSW, Paper presented to the Murray-Darling Basin Ministerial Council, Canberra, Australia, 1997.
- Department of Sustainability and Environment (Victoria), *Securing our water future together*, DSE, Melbourne, 2004.
- Fyfe, M., Dwindling reserves reflect our thirst, *The Age*, October 30, 1, 2004-11-08
- Gramlich, E. *Benefit-Cost Analysis of Government Programs*, Prentice Hall, Englewood Cliffs 1990.
- Horn, M. *The Political Economy of Public Administration: Institutional Choice in the Public Sector, Political Economy of Institutions and Decisions*. Cambridge: Cambridge University press, 1995.
- Jha, R. *Modern Public Economics*, Roulledge, London, 1998.
- Langford-Smith, T. and J. Rutherford, *Water and Land: Two Case Studies*, Australian National University Press, Canberra, 1966.
- Murray-Darling Basin Commission, A brief history of the Murray-Darling Basin Agreement, MDBC, Canberra, 2000
- Murray-Darling Basin Ministerial Council, The living Murray: A discussion paper on restoring the health of the River Murray, MDBC, Canberra, 2002.
- National Competition Council, National Competition Policy Update, NCC, Melbourne, 1998.
- National Competition Council, Water: National Competition Policy Assessment of Water, NCC, Canberra, 2003.
- Quiggin, J., Environmental economics and the Murray-Darling river system, *Australian Journal of Agricultural and Resource Economics*, 45(1), 128, 67-94, 2001.
- Randall, A., Property entitlements and pricing policies for a mature water economy, *Australian Journal of Agricultural Economics*, 25(3), 128, 195-220, 1981.
- Tan, P. Legal issues relating to water use, MDBC, Canberra, MDBC, 2002.
- Victorian Water Industry Association, Victorian Water Review 02-03, VWIA, Melbourne, 2003
- Watson, B., An overview of water sector issues and initiatives in Australia, in *Transferability of Water Entitlements*, edited by J. Pigram and B. Hooper. Centre for Water Policy Research, Armidale, 1990.

Watson, A., Approaches to increasing river flows, *The Australian Economic Review*, 36(2), 213-24, 2003.



Figure 1

## About the Authors

*Dr Lin Crase*

Lin Crase is a Senior Lecturer in the School of Business at La Trobe University's Albury-Wodonga campus. His research has focussed on regional resource allocation, particularly water resource reform. He is the author of numerous articles on the impacts of water reform and matters of institutional design on Australia and elsewhere.

*Brian Dollery*

La Trobe University, Australia.