The Paradox of National Water Savings: A Critique of 'Water for the Future'

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Abstract

The Commonwealth's assumption of greater control over water policy has been justified on the grounds that a 'national approach' to the problems in the Murray-Darling Basin is required to resolve the ills of the Basin. This paper investigates the validity of this contention in the context of the Federal government's 'Water for the Future' manifesto. The paper argues that the current naïve understanding of 'water use efficiency' concepts is likely to stymie any purported basin-wide gains from a 'national approach' to water policy.

Introduction

The Howard government's *National Water Plan for Water Security* culminated in the Commonwealth Water Act in 2007. [3] A key component of this approach is a focus on the formulation of water resource policy at the national level, or at least at the whole-of-basin level in the context of the Murray-Darling Basin. The justification for this approach is that a national body is best able to assess and deal with basin-wide problems and overcome the dilemmas arising from competition between differing state jurisdictions.

Consequently, the Water Act (2007) legislates for the establishment of the Murray-Darling Basin Authority which, amongst its other obligations, has responsibility for 'ensur[ing] that Basin water resources are managed in an integrated and sustainable way' (Department of Environment, Heritage, Water and the Arts 2008). Gaining universal agreement for the Murray-Darling Basin Authority at the Council of Australian Governments (CoAG) meeting in July 2008 was proclaimed as one of the most significant accomplishments of CoAG.

The rationale for superordinate management of water resources in an interconnected basin resonates with many in the electorate. The extant degradation of the Murray-Darling Basin's riverine environment has been used to illustrate the urgent need for national intervention. For example, in the context

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[3] In April 2008 the newly elected Federal Labor government signalled its intention to continue, in the essentials, the Howard government's approach to Australia's water resources.

of over-allocated water resources the Federal Minister for Climate Change and the Environment observed that 'like many areas of public policy involving multiple levels of government, water policy has been derailed by bickering and blame' (Wong 2008a: 2). Similarly, the Minister argued that Commonwealth action was required to ensure that the nation as a whole 'make[s] better use of our available water resources' (p.3). Hopefully, and perhaps naïvely, the Minister also contends that 'this means improved efficiency and productivity of water use, and better use of water markets to optimise the economic benefits that water brings'.

Notwithstanding the political appeal of national control of water resources in connected systems (such as the Murray-Darling Basin) and the mileage from proclaiming the benefits of water-use efficiency, the most recent episode of national intervention does not augur particularly well. A superficial understanding of core concepts such as 'irrigation efficiency' and the pervasive influence this can have over the allocation of funding, provide grounds for questioning the efficacy of the national control of water resources. Put simply, the benefits of a system-wide approach to decision-making are quickly eroded when the criteria upon which decisions are predicated are themselves seriously flawed.

Of particular concern in this context is the resolution by the Federal government to co-sponsor the modernisation of irrigation in Victoria to the tune of $1 billion. We contend that this stands to significantly reduce the quantum and reliability of water supplied to those who extract water downstream of the Goulburn Valley, and also seems likely to weaken existing environmental claims in the River Murray. The assertion by some that national decision-making is a sufficient condition for achieving improved environmental outcomes in the Murray-Darling (see, for instance, ABC On-Line 2007) is thus both overly-optimistic and unhelpful.

The circumstances that have led to these events are traced in this paper. We argue that downstream states such as South Australia, which ironically has been amongst the most vociferous supporters for increased national intervention, will be a significant loser as a result of upstream 'renovation' of irrigation. We also aim to shed light on the flawed use of concepts such as 'water-use efficiency' particularly when it is portrayed as an environmental saviour and thus deserving of support from the public purse.

The paper comprises four parts. In the next section we briefly outline the political and policy background that gave rise to the decision by the Federal government to play a greater part in water policy. This is followed by a review of the various concepts of water-related efficiency. Importantly, this section illustrates the critical issue of scale when measuring and accounting for water use. The *Food Bowl Modernisation Project* (FMP) in northern Victoria and the

Federal government's decision to support this project with a $1 billion injection from its own coffers are reviewed in the fourth section. The final section comprises some brief concluding remarks.

The Policy Context for Federal Intervention

Australia's water resources were unequivocally vested in the states when the constitutional reformists chose to reject the doctrine of riparianism [4] in the late nineteenth century (Musgrave 2008: 35). This was ratified in the constitution itself by the inclusion of Section 100 which sought to constrain interference by the Commonwealth and limit national powers to 'abridge the rights of the State or of the residents therein to the reasonable use of waters of rivers from conservation or irrigation'. Given such a strong stance against Commonwealth intervention, this meant that agreement was required between those states that shared the water resources in the Murray-Darling Basin. Accord originally took the form of the River Murray Agreement of 1914 which has subsequently evolved into the Murray-Darling Basin Agreement. These arrangements leave Basin water management in the hands of representatives of each of the signatory states plus an agent of the Commonwealth. Notwithstanding that the Commonwealth intermittently played an influential role in several earlier water-policy decisions, such as the Snowy Mountains development, the Commonwealth's authority over water resources in the Murray-Darling remained largely in line with the intentions of the constitution until the mid 1990s.

Commencing with the CoAG Agreement on Water Resource Policy in February 1994 and the related Competition Principles Agreement of 1995, the Federal government has progressively sought to increase its influence over the water-policy agenda. For the first decade or so, this was accomplished primarily through the suasive influence of the Federal purse. The early CoAG reforms and the National Water Initiative (NWI) of 2004 were all premised on state jurisdictions complying with a national framework in order to be eligible for tranche payments from the Federal government. As an illustration of the rise of national and collective decision-making, almost half of the projects embodied in the 2004 NWI required national action or a heavily coordinated response from state jurisdictions (McKay 2008: 55). However, the primary mechanism for achieving this cooperation was the $2 billion to be allocated by the National Water Commission as part of the Australian Water Fund.

These arrangements changed markedly in 2007 when the then Prime Minister announced his intentions to legislate a National Plan for Water Security. At the time, the Prime Minister expressed exasperation about the slow progress on reform and proclaimed that 'the tyranny of incrementalism and the lowest

[4] Riparianism effectively allows landowners to exploit water that attends or adjoins their property on the proviso that such use does not unreasonably interfere with the existing rights of other landholders.

common denominator must end' (Howard 2007: 1). Similarly, Prime Minister Howard decreed that national intervention was required to solve the problems of the Murray-Darling Basin and argued that 'as long as integrated water systems are being managed piecemeal by governments with competing interests, the execution of even the best national agreements will remain challenging and contentious'. National decision-making was espoused as the solution to water management in the Basin.

To give effect to the *National Plan for Water Security* Prime Minister Howard sought the referral of state powers from Basin jurisdictions. In return the Commonwealth committed about $10 billion over 10 years to address environmental degradation and over-allocation. The largest portion of the funding ($6 billion) was to be allocated towards engineering solutions to enhance the 'efficiency' of irrigated agriculture. This 'modernisation' of irrigation was claimed to deliver 'water savings' which could then be used to underpin environmental sustainability.

The *National Plan for Water Security* was both hurriedly prepared and ambitious. Given the government's standing in the electorate at that time, the formulation of the *National Plan* was arguably more an act of political desperation than it was a response to concerns about deficiencies in water-resource management. As Watson (2007: 1) noted, the authors of *The Plan* were 'not claiming spurious accuracy for their major proposals. As subsequently emerged, the ten-point *Plan* to spend $10 billion over ten years was prepared in haste, well away from the troublesome gaze of Treasury and Finance officials and the experienced eye of the Murray-Darling Basin Commission.'

Regardless of the financial inducements on offer, the Victorian government refused to sign up to the *National Plan for Water Security* and the then Federal government proposed the Water Bill 2007 without the complete referral of powers it had sought. The Explanatory Memorandum (p.2) that accompanied the Bill argued that Commonwealth control and decision-making would 'enable water resources in the Murray-Darling Basin to be managed in the national interest, optimising environmental, economic and social outcomes'. The Memorandum simultaneously signalled that this would be accomplished by four main funding targets: namely, 'modernising Australia's irrigation infrastructure; addressing over-allocation in the Murray-Darling Basin; reforming management of the Murray-Darling Basin; and new investments in water information'.

The Howard government was defeated and the Federal Labor government took power in November 2007. In April 2008 the Minister for Climate Change and Water released a broad outline of the new government's water policy in the form of *Water for the Future*. This document generally mirrors the former government's approach insomuch as non-trivial public funds have been earmarked for the purpose of 'modernising irrigation' whilst a lesser but

significant emphasis has been placed on restoring balance by buying back water-access rights. In the context of 'modernising irrigation', the federal government specifically undertook to sponsor the renovation of irrigation infrastructure in Victoria to the tune of about $1 billion, bringing the total commitment from State and Commonwealth governments to $2 billion. Some commentators have viewed the generosity of the Federal government as a reward to the Victorian government for its resistance to earlier calls by the Howard government's request for referral of powers (see, for example, Milne 2008).

Federal support for 'modernising' Victoria's irrigation was subsequently ratified at the CoAG meeting in July 2008 when a further $103 million was committed to assist with upgrading irrigation infrastructure in the north west of the state under the guise of the 'Sunraysia Modernisation Project'. New South Wales was also offered $1.358 billion mostly for 'water saving' initiatives in irrigation, some of which were described as being 'at the conceptual planning stage' (CoAG 2008b). A total of $610 million was offered to South Australia, mostly for projects that purportedly 'upgrade irrigation infrastructure', whilst Queensland is expected to receive $510 million for water projects. In the case of Queensland, $350 million is set aside for purchasing water entitlements from willing sellers but most of the remaining funding is to assist with the 'roll-out [of] community level irrigation planning and infrastructure investment' (CoAG 2008b). By the completion of the CoAG meeting in July, the Federal government had committed about $4.3 billion to projects across the Basin, the majority focusing on water infrastructure projects. The espoused view of CoAG was that '[t]hese measures will reduce water loss and return water to the environment to help restore the sustainability of the resource and enable a long-term future for the communities of the Basin' (CoAG 2008b).

An important caveat was added to most of these funding initiatives; that projects would be 'subject to due diligence' (CoAG 2008b). Regrettably, this is not defined with precision but presumably it is likely to be politically difficult to reverse such commitments should the projects actually prove deficient.

Setting aside the financial and political dimensions to these decisions for the moment, there must now be serious concerns about the capacity of a national water Ministry to deliver efficacious outcomes at a basin-wide scale. Of particular concern is the continuing naïve support for the view that 'modernising irrigation' or investing in 'water-use efficiency' can generate substantial and fungible 'water savings' at a basin level. A brief review of these critical concepts is presented in the following section.

Efficiency and Water

In the context of irrigation, the common perception is that increasing efficiency in agriculture can provide a solution to the water crisis and result in 'wins' for

all players (Molle and Turral 2004; Seckler *et al*. 2003). In contrast to the economist's conceptualisation of efficiency, irrigation efficiency is primarily an engineering concept concerned with the volume of water diverted and consumed (Cai *et al*. 2001). Engineering interventions in an attempt to 'save' water or to 'reduce losses' from an irrigation system are frequently said to improve 'water-use efficiency'. However, substantial confusion surrounds these concepts, despite the fact that they are often used interchangeably. Perry (2007: 373) argues that this confusion has frequently resulted in not only ineffective, but also undesirable, outcomes from technical interventions to 'improve' irrigation efficiency.

Perry (2007) traces the development and use of various conceptualisations of efficiency back to the original contribution by Israelson (1950) that came to be known as classical irrigation efficiency. Israelson defined irrigation efficiency as the ratio of the water consumed by crops of a farm or system to the water diverted. Despite later elaboration and development, [5] Israelson's original definition, based ostensibly on the relationship between water used by the crop and the water diverted, remained the underlying basis for water accounting.

Importantly, the classical concept of irrigation efficiency ignored the potential for return flows and recycling. Later contributions to the debate emphasised the use of ratios or fractions to describe water use and to explicitly consider the impact of return flows (See, for example, Jensen 1993; Willardson 1994; Allen *et al*. 1996, 1997). According to these definitions, water diverted for irrigation could be divided into the consumed fraction, comprising beneficial consumption (intended purposes including environmental) and non-beneficial consumption (for example, weeds). The remainder was classified as the non-consumed fraction and this comprised two groups — recoverable flows and non-recoverable flows (Perry 2007: 372).

This approach highlights the fact that not all water purportedly 'lost' from a particular irrigation district in fact constitutes a loss to the hydrological system as a whole. For instance, take the case where an irrigation district in Victoria presently generates non-consumed flows that are then 'recovered' in the form of an environmental use in the River Murray or via extraction by a downstream or groundwater irrigator in South Australia. If actions are taken to reduce the non-consumed fraction in the irrigation district, the net impact of these activities must take into account the redistribution of water away from existing users (say the environmental use or the downstream irrigator). If the intent is to 'save'

[5] Definitional refinements included attention to the concepts of consumptive beneficial use which comprises the quantity of water effectively used to control soil salinity (Jensen 1967) and distribution and application efficiency (Bos and Nugteren 1974; Bos and Nugteren 1982). 'Distribution efficiency' is the ratio of the volume of water delivered to the fields to the volume delivered to the distribution system. 'Application efficiency' is the ratio of the volume of water needed (and made available) to meet the evapotranspiration needs of crops compared to the volume of water delivered to the fields.

water, it is vital to know whether the 'losses' from the irrigation system are in fact losses at all. After all, when water is 'lost' from an irrigation district in Victoria it does not go to Mars. Similarly, in an international context, Sakthivadivel and Chawla (2002) expose the flawed reasoning that redirecting seepage losses to cities was seen as the best way to increase supply without impacting existing uses, but the 'losses' were found to be already tapped by other users.

The issue of scale of analysis assumes particular importance in this context and further developments in water accounting conceptualised the idea of water balance at the basin level (Molden and Sakthivadivel 1999; Perry 1999; Seckler *et al*. 2003). In an Australian context, Gyles (2003: 13) demonstrates the 'illusory' nature of water savings and argues that this derives from '…errors in logic and the inability or reluctance of the promoters to view water flows in a systems context'. Notwithstanding these developments, 'improvements' in irrigation efficiency continue to be calculated at farm or irrigation system level without regard for the overall impact on basin balances.

The importance of scale

At the global level in the long term, evaporation from water bodies and evapotranspiration from land and vegetation must equal precipitation. However, as soon as the frame of reference is spatially or temporally narrowed, flows across borders become of vital concern (Perry 2007). Similarly, Perry (2007) notes that only where river flows are sufficient to meet demands, can irrigation efficiency be examined in isolation (as is done in classical efficiency). Thus, given the intensified sectoral competition under conditions of severely limited supply, it becomes increasingly important to conceptualise water use at the basin level. From this perspective, distinctions must be made between consumptive uses which remove water from the current hydrological cycle and non-consumptive uses which return the water for potential reuse. Moreover, 'changing scale draws us from a mere question of cost-effectiveness of water-saving technology into a wider and thornier question of water allocation, rights to extract water and regulation of its use' (Molle and Turral 2004: 10).

Adopting a 'basin-wide' perspective invokes the 'water-efficiency paradox' since when water is used, a substantial part of it is not 'used up' but is retained within the hydrological system (Seckler *et al*. 2003). It is therefore possible for each component part of a water system to exhibit low water-use efficiency but when viewed from the perspective of the system as a whole, it may be quite efficient. This paradox means that there are many instances of purported water 'savings' that when analysed further amount to no more than a redistribution. For example, Molden and Sakthdivadivel (1999) illustrate the importance of the scale of analysis in estimations of classical efficiency, citing the example of Egyptian irrigation, which is approximately twice as efficient when measured

at a basin level compared to the field level. In simple terms, this arises because water that is 'lost' or 'leaks' from upstream users is frequently recaptured by downstream users.

Seckler, Molden and Sakthdivadivel (2003: 37) argue that the potential to 'save' water is overestimated as the application of a majority of the concepts of water-use efficiency '…systematically underestimate the extent of existing efficiency by a very large amount'. Viewed from this perspective, gains to be made have been much overestimated and purported savings merely result in some users being able to increase their usage whilst others downstream face reduced availability. Thus, these interventions result in spatial shifts or reallocation of water rather than 'savings' (Molle and Turral 2004). The implication is that local interventions to 'save' water are likely to alter the flow regime and impact on other users. In the case of closed basins (defined by Molle and Turral as those with a relatively small amount of uncommitted run-off leaving the basin) with major constraints of water scarcity, gains in local efficiency eventually amount to reallocation. Clearly, the modest flows making their way to the mouth of the Murray and the much-publicised excessive demands for water in the Basin places the Murray-Darling in this category.

The literature contains a number of examples that highlight the fallacy of water savings on a basin level (see, for example, Perry 2007; 2008). Molle and Miranzadeh's 2004 case study in Central Iran highlights the interconnectedness of water users in a closed basin. They conclude that micro level conservation through canal lining, did not eventuate in the expected water 'savings' but 'only led to having more water spread and depleted locally to the detriment of users downstream' (Molle and Miranzadeh 2004: 3). Until policy-makers understand that all water that 'leaks' from a channel does not automatically constitute a loss to the system as a whole then similar policy disappointments will occur in Australia. Estimates of the quantum of water to be realised by a particular 'water-saving initiative' are all-too-often exaggerated because the only water that can really be saved is that portion that enters a saline sink or evaporates and that which is consumed in non-beneficial consumption. Even in the case of the latter (say irrigation water consumed by weeds instead of crops), this water is seldom made available for other users since farmers invariably use the 'saved' water to expand production on site.

Molle and Turral (2004) refer to the supposed 1998 'win-win' agreement between Southern California Metropolitan Water Authority and the Imperial Irrigation district. This agreement included the lining of canals and the transfer of usufructuary rights to Los Angeles equivalent to the amount 'saved' through this measure. The actual impact of this project, viewed from a basin-wide perspective, was the deterioration in the quality of the recharge to aquifers tapped by farmers on the other side of the border in Mexico (p.4). While the

impetus for this type of agreement may be understandable in the context of competing national jurisdictions, it is difficult to discern its logic in an Australian setting.

In short, the purported 'savings' that emanate from improved storage or conservation at one point in a basin necessarily diminish that available further downstream (Molle and Turral 2004). Moreover, any analysis of water-use efficiency must take account of the particular context (location of diversions, and so on) lest the analysis become 'worse than meaningless [causing] wrong decisions to be made economically, hydrologically and ecologically' (Perry 2007: 369).

Food Bowl Modernisation and an Integrated National Approach?

On the basis of the preceding discussion it would appear that there is some merit in taking a national approach when water resources are shared across competing jurisdictions. For example, without a national approach, a full appreciation of the downstream impacts of investments in 'water-use efficiency' in one upstream jurisdiction may not emerge. Regrettably, there is no evidence that this broader, integrated view has arisen from national intervention in Australian water policy. To illustrate this problem we use this section to describe and analyse the *Food Bowl Modernisation Project* (FBMP), which recently won the support of the Commonwealth government. Similar arguments may well apply to other projects of this genre although the absence of data on many, particularly those that are 'currently at the conceptual planning stage' (CoAG 2008b) makes scrutiny problematic.

The euphemistically named FBMP forms only one component of the Victorian Government's ambitious water policies assembled under the *Our Water Our Future* framework in 2007. This framework also comprises the construction of a 150GL desalination plant in the Wonthaggi region, expansion of the Victorian water grid by establishing additional pipelines between major centres, increased capital expenditure on water-recycling projects and additional support for water-recycling programs.

The FBMP has six key elements.

First, manual structures for managing the supply of water via channels are to be replaced with automatic channel-control technologies.

Second, some sections of the open-channel network are to be replaced with pipes and/or remodelled.

Third, Dethridge wheels (which measure water use) are to be replaced with more accurate metering devices. [6]

Fourth, changes to water charging to reflect the additional investment base are foreshadowed. [7]

Fifth, some farm system adjustments, such as a reduction in the number of off-takes, [8] are anticipated as part of the project.

And sixth, a sequence of consultations and communication to adjust to different service demands are predicted (DSE 2008).

The FBMP reportedly aims to 'save' 225GL of water per year by improving distribution efficiency with the resulting 'savings' to be shared equally — one-third being allocated to irrigators, one-third being exported to Melbourne via the Sugarloaf pipeline, and another third assigned to environmental uses. [9]

In total, the *Our Water Our Future* initiatives are estimated to cost $4.9 billion, with 90 per cent of the cost being borne by water consumers via increased charges (Victorian Auditor-General 2008: 19). Like the Howard government's *National Plan*, the Victorian initiatives were hurriedly assembled over a six-month period, largely in response to the unprecedented low inflows in 2006. Whilst the Victorian Auditor-General concedes that 'the speed of the response' may account for some of the deficiencies in planning, he nevertheless observed that 'for some of the key projects the rigour was inadequate' (p.v). In the case of the FBMP, the Auditor General specifically noted that 'the upgrade costs (reported in the plan) represent the lowest level of rigour and were, at the time, based on a preliminary study by a stakeholder group (the Food Bowl Alliance)' (p.31). Importantly in the context of 'water savings', the Auditor-General also sourced earlier work used to develop the business case for the FBMP and found that in these earlier documents 'the estimated water losses were more refined and **lower** than those published in the food bowl steering committee's final report in November 2007' (p.35; original emphasis).

In order to shed additional light on the magnitude of this problem it is worth considering some of the earlier work undertaken on water-use efficiency in this

[6] It is a moot point whether replacing devices that inaccurately measure water will actually reduce water use.

[7] It is not at all clear to the authors how the G-MW charges will be adjusted to account for infrastructure that is substantially gifted to irrigators by other taxpayers.

[8] Each farm might have several points at which it draws water from the irrigation network. These are referred to as off-takes.

[9] A gigalitre is the equivalent of a billion litres of water but the metrics of water frequently prove vexing for the uninitiated. Politicians often resort to 'Olympic swimming pools' or 'Sydney Harbour' as the metric for the convenience of voters. In the interests of providing a more meaningful comparison we offer the following: a household tap left running full for an hour will usually use 1000 litres of water (that is, a kilolitre or 1 cubic metre); the Victorian government is supporting a program to reduce Melburnians' water consumption to 155 litres per person per day, or about 226 kilolitres for an average four-person household per year; in 2007 Melbourne's annual water consumption was about 370 gigalitres.

setting. Of particular interest is a pre-feasibility assessment undertaken by Marsden Jacob on behalf of the Murray-Darling Basin Commission in 2006. This work was undertaken primarily to assess the quantum of water that might be 'recovered' from the Shepparton Irrigation Area (SIA). The project had three main goals: to reduce irrigation outfalls through channel automation; to improve the detection of losses in the channel system; and to undertake investments in seepage and leakage reduction. The SIA is only one of six districts covered by the FBMP but the empirical approach and findings are instructive on several grounds.

To estimate the quantum of water that might be 'saved' by this project Marsden Jacob and Associates (2006) categorise the various forms of distribution losses within the irrigation network. In the context of the proposed automated channel technologies that forms a core part of the FBMP, the greatest potential for 'savings' is attributed to the water 'lost' through channel outfalls. A channel outfall is the mechanism by which excess water and return flows pass from the irrigation network to the surrounds. In some instances, this will be a structure that links to a river or, in other cases, water might pass to a swamp, creek or depression. [10] Marsden Jacob and Associates (2006: ESiii) concede that 'the destination or final use of this return flow is unknown but could conceivably include extractions by diverters in the Goulburn and Broken system or discharge into the River Murray where it becomes part of the tributary contribution to Victoria's share of the River Murray water resource. Notwithstanding this caveat and numerous instances where data were unavailable or embodied significant measurement error (see, for instance Marsden Jacob and Associates 2006: 16; 21) the study arbitrarily assumed that differing percentages of the water that entered outfall drains constituted return flows. These range from an assumed 10 per cent return flow for four large drains to 100 per cent return flow where the outfall was directly to a river. An accompanying assumption was that 50 per cent of all outfalls came about as a result of rainfall rejection flows. These flows arise when irrigators close their receiving infrastructure because of heavy rainfall during an irrigation event. Put differently, this study assumed that a significant portion of the water rejected by farmers had no other use, including maintaining in-stream flows. Whilst it is encouraging that the study at least acknowledged the existence of return flows, there is considerable conjecture about the actual volume of water involved, its present uses and possible end destination. In addition, whilst the FBMP forecasts a change in distribution efficiency from 70 per cent to 85 per cent, Marsden Jacob and Associates (2006) offer a more cautious

[10] For those less familiar with irrigation it might seem odd that water would 'return' via an outfall from an irrigation network. However, irrigation is not a precise science and the water drawn off by farmers cannot always be judged accurately (say in the instance where a farmer has ordered water but rainfall forces them to 'reject' the flow for fear of waterlogging). The key issue of concern here is what happens to those flows thereafter.

outcome suggesting a change from 70 to 80 per cent as being plausible. The upshot of the work by Marsden Jacob and Associates is that there is considerable conjecture about where the water purportedly 'lost' from the Goulburn Valley is presently going. Moreover, redistributing this water under the guise of irrigation efficiency runs the risk of depriving existing users with low-ranking claims, including environmental beneficiaries.

There are two key issues here. First, water is invariably fugitive and measuring it with precision is costly and difficult. This is not unique to Australia and, as we noted in the earlier section, there are numerous projects around the world where the purported 'water savings' turned out to be much less than the original estimates used to justify the project. Second, the scale of analysis and the incentive to focus on local water use invariably leaves downstream users worse off. Without a clear view of the quantum of return flows before embarking on a 'modernisation project' it will always be difficult to assess the actual detriment to downstream users/uses. Moreover, once the project is completed it will be costly and difficult to redistribute the resource in its original configuration. This is further complicated in the context of the FBMP since one-third of the water 'saved' is purportedly to be used for environmental benefit. Since there is uncertainty about the quantum of water presently accruing to 'the environment' under the status quo, it will not be possible to test whether the 75GL assigned for 'the environment' represents an increase or decrease in environmental amenity.

Notwithstanding these uncertainties, inconsistencies and potentially flawed logic, the Federal government announced its support for the FBMP in March 2008, following the twenty-first meeting of the CoAG. In reaching this decision, the Commonwealth 'agreed in principle to fund 90 per cent of the project costs, up to $1 billion of the Stage Two Food Bowl Project in Victoria, subject to a due diligence assessment and delivery of half the gains in additional flows to the Murray River' (CoAG 2008a: 7). The Commonwealth also signalled to other states that it intended to continue down the path of 'modernising irrigation' and funding additional 'water saving' projects. The largesse of the Commonwealth at the July meeting of CoAG gave effect to this commitment.

Regrettably, the mythology that attends 'water-use efficiency' projects seems likely to be perpetuated. Even within the academic profession there are signs that the fiscal suasion of the Federal government can override water distribution logic. In June 2008, the Federal government announced $8.6 million of funding to two universities that have long and distinguished histories in hydrology. The project reportedly aims to 'find ways to make better use of the water we have, creating benefits for both farmers and the environment' and to 'provide farmers with practical ways to make the most of available irrigation water supplies — including rainfall and recycled water — through better planning, technology

and predictive tools' (Wong 2008b: 1). Unfortunately, there is no indication that the project will assess the impact of these measures at a wider and more appropriate scale.

On a more cynical note, the political allure of the water-use efficiency chimera shows no signs of weakening. By definition, water politics is hard work and orchestrating the genuine redistribution of a tightly held resource in favour of broader environmental interests was always going to be viewed by the polity as a zero-sum game, at best. Convincing the electorate that more water can be 'created' in order to satisfy environmental interests whilst maintaining the existing distribution of rents remains far more politically palatable, even if this approach results in long-run negative outcomes.

Concluding Remarks

The lack of precision that has attended a project of the magnitude of the FBMP and the willingness to use public monies to fund elaborate engineering projects to 'put water to better use' is reminiscent of an earlier era of water policy in Australia (see, for instance, Watson 2007). During this earlier phase, water resources were viewed as a resource to be harnessed in order to foster growth — firstly at the state level and then, incidentally, at the national level.

Many policy analysts were buoyed by the CoAG reforms which signalled a move to a more rational allocation of water resources and greater concern for the underlying requirements to maintain ecosystem health. There was also evidence of a more integrated consideration of resource management as manifested in the Murray-Darling Basin CAP, for example. Nevertheless, state governments, arguably in an effort to do the best for their constituents, had generally resisted calls for national control of water resources, unless coupled with substantial financial incentives. Decision-making at the state level also encourages excessive investment in local water-saving projects since this maintains the resource, and the benefits that accompany that resource, in a given jurisdiction. This approach was seen as counterproductive and resulting in narrowly defined decision criteria that often privileged particular water users in particular states over basin-wide benefits.

Against this backdrop the expanded role of the Commonwealth in water-resource policy in the last two years was heralded by many as a way of accelerating reform and dealing with inter-state rivalries. After all, a national government should be able to consider issues at a basin scale and establish policies that support optimisation of the resource at that level.

Regrettably, the most recent forays of the national government fall well short of this mark. Moreover, the present enthusiasm for 'modernising irrigation' stands to replicate and even exacerbate earlier mistakes. Arguably, these decisions are also illustrative of a gross misunderstanding of the rudimentary theories

necessary for making sound policy at a basin scale. As Perry (2007: 368) observes 'poor theory can lead to ineffective and even counterproductive actions. Many of the problems of water today are due to the implementation of false, erroneous or misapplied concepts of efficiency in water resource policy and management.' Regrettably, it would appear that national governments drawn into the politically appealing but flawed logic of water-use efficiency are just as capable of presiding over the degradation of the Murray-Darling Basin as are the states.

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