PAR PUBLIC ADMINISTRATION REVIEW

Kimberley R. Isett, Brian W. Head, and Gary VanLandingham, Editors

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Water Policy in a Time of Climate Change: Coping with Complexity

Evidence in Public Administration

Abstract: *The unpredictable impacts of climate change, combined with significant social and economic changes, mean that policy analysis is becoming inordinately more complex. Coping with this increasing complexity while engaging with a full range of stakeholders and the community requires a new approach to leadership and governance. Water planners (and others involved in the planning processes) need new skills in active listening and constructive cultural behavior, and all agencies need to recognize that thinking and acting only in the interests of their own silo of responsibilities will inevitably produce suboptimal outcomes. Leadership focused on constructive behavior that recognizes and rewards generosity of spirit across disciplines and between organizations is the foundation of this new approach.*

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When I studied engineering and economics some 40 years ago and then commenced a career in public policy and strategic management, the "best-practice" approach to assessing the worth of water policy and water projects followed a linear process, generally along these lines:

1. Specify the water supply challenges to be resolved in a particular situation.
2. Identify the options for solving the challenges—generally in terms of physical assets (dams, pipes, treatment plants, etc.), new policies, legislation, or governance arrangements.
3. Assess the benefits and costs associated with each of the options—within the framework of a "triple bottom line" assessment, using the best science available to quantify such impacts wherever possible.
4. Subject the preferred option to environmental and social impact assessments involving community and stakeholder consultation.

The underlying planning premises of this process were as follows:

- Past trends or patterns of biophysical factors (population growth, rainfall patterns, ecological conditions) would provide a reasonable basis for developing future projections.
- Technologies that had been used to solve problems in the past were a starting point for solutions in the future (in the case of Melbourne, Australia, for example, if more water was needed, the first option to be considered was to build another dam).
- Water systems could be developed and enhanced to follow population growth ("plumbed-in" when needed).
- The community would accept the judgment and expertise of respected institutions and public servants in these matters.

However, in recent times, these premises have been fundamentally challenged by a range of disruptive factors at both a global and a local level. The most significant factors are as follows:

- Climate change—we can no longer use the biophysical patterns of the past to plan for the future.
- Rapid urbanization—particularly in developing countries.
- Livability—the combined effects of climate change impacts and rapid urbanization are undermining the ability of cities to provide for the full range of human needs.
- Scale—associated with the opportunities opened up by new technologies, a realization that smaller-scale, fit-for-purpose, locally based solutions can sometimes provide for greater resilience within integrated systems.
- Citizen expectations—all around the world, citizens are demanding greater involvement in policy decisions that affect their lives.
- Time constraints—as the complexity of decision making has increased, so has the time necessary to undertake meaningful engagement, and yet climate change and urbanization pressures can lead to crises that require solutions sooner rather than later. Every proposal has an optimum gestation period.

Public Administration Review, Vol. 77, Iss. 1, pp. 13–16. DOI: 10.1111/puar.12669.

Taken together, these factors mean that contemporary public policy and project evaluation processes are orders of magnitude more complex than those we followed in the last decades of the twentieth century. The linear processes and planning assumptions have been turned on their head in the face of wicked problems, and public sector practitioners now need new approaches in order to deliver sound policy outcomes. They also need to take into account factors that are important to political decision makers. In my experience, there are three additional factors that often influence the priorities of political decision makers:

- The perceived urgency of the issue. Is there a "burning platform"—that is, is there a major crisis (economic, environmental or social) that a political leader or government needs to resolve? When such conditions exist, political leaders will seek a solution.
- The desire for solutions that are simple and appealing to a general cross-section of the public—solutions that are conceptually elegant and can be presented in plain language.
- Solutions that appear bold and "game changing" can be appealing.

It is widely noted that these political drivers can at times be directly at odds with the nuanced complexity required to resolve the sorts of wicked problems outlined previously.

In light of the policy and political complexities noted here, I examine the extent to which some recent major decisions in water policy in Australia have been able to retain evidence-based analyses in the face of political imperatives and to provide an adequate gestation period to facilitate authentic engagement.

The Murray-Darling Basin Plan

The Murray-Darling Basin river system, located in the interior of southeastern Australia, drains around 15 percent of the Australian land mass and encompasses significant agricultural areas in four states and one territory within the Australian federation. The state level of government has constitutional responsibility for managing water resources within its boundaries. Unfortunately, over the previous century, water was allocated to irrigators by different state authorities at levels that we now know exceeded the sustainable yield of most rivers within the basin. When the record low flows of the "millennium drought" hit the basin between 1998 and 2009, major environmental problems emerged in the form of significant salination and ecological destruction in the basin waterways and critical shortages of water for irrigation and town purposes. The burning platform was the specter of large-scale economic, social, and environmental disaster.

In 2007, John Howard, prime minister of Australia, stated that "the current trajectory of water use in Australia is not sustainable. In a protracted drought and with the prospect of long-term climate change, we need radical and permanent change. . . . The tyranny of incrementalism and lowest common denominator must end. . . . I am therefore requesting that [the states and territories] refer to the Commonwealth [the Australian national government] their powers for water management within the Murray-Darling Basin" (Howard 2007). The initiative included the establishment of a new Murray-Darling Basin Authority to manage the basin's water resources in the national interest and $10 billion for programs and actions "to improve water sufficiency and address the over-allocation of water in rural Australia."

Once the national government had established the strategic policy framework for negotiating and developing a solution, there was no shortage of evidence about what was needed. Informed advice was provided by a range of stakeholders, including the individual state governments, environmental groups, science groups, and the irrigation community. There was an intensive search to determine the amount of water required to be reallocated back to the river to provide for a healthy and sustainable river system. Estimates of the appropriate amount varied from 7,600 gigaliters (GL) per year to around one-third of that amount. An esteemed group of scientists supported a figure of at least 4,000 GL per year (Wentworth Group 2012).

Eventually, following three years of protracted negotiations between the states, irrigators, and environmentalists and the commissioning of a range of scientific modeling and analyses, the government adopted a plan proposing that 2,750 GL per year be returned to the rivers.

This was one of the biggest policy reforms in the history of Australian water resource management, and it was driven largely by political imperatives. Evidence-based analysis played a part in setting boundary conditions, but science alone did not determine the final solution. At the announcement of the final plan, one of the lead scientists involved in a major review of the options concluded that the policy proposal was "informed by science, socio-economic analysis and community views" and by an "appropriate trade-off between competing interests, largely environmental needs and agricultural needs" (Young 2011).

In 2006, all sections of the Australian community were aware that a crisis existed in the Murray-Darling system, and all stakeholders and the public were searching for solutions. The circumstances therefore were conducive to the achievement of a negotiated solution, or compromise. The dominant political factors were aligned: there was a big burning platform to contend with and relatively simple narratives that all could access ("something is needed to give more water to the dying rivers"). It was certainly a bold and game-changing solution. Under these circumstances, it is not surprising that evidence-based science played an important but not determinative role in shaping the final outcome.

A Desalination Plant for Melbourne: A Tale of Two Strategies

Strategy 1

In October 2006, the Victoria State Government published its *Sustainable Water Strategy for the Central Region of Victoria*—a large region that includes Melbourne, the capital city (DSE 2006). The strategy was the result of a comprehensive 18-month consultation process with the community. The consultation process for developing the strategy, and indeed the recommendations of the strategy itself, were widely commended and supported by all stakeholders.

Based on comprehensive assessment of options, supported by an independent and transparent peer-review process, the strategy

concluded that "if the low inflows (to reservoirs) continue, we will need an extra 145 GL for urban use across the region by 2015, increasing to 300GL by 2055." The strategy went on to state that "there is no single solution to the problem of water scarcity. The Government will use a variety of approaches to secure our water future, including conservation and efficiency, re-use and recycling, interconnections and augmentations." The document also stated "the Government will work with the water authorities to complete *a feasibility study for desalination options* for Melbourne and proceed to business cases *if appropriate*" (emphasis added).

At this stage, there was no sense of great urgency and no perceived need for big policy shifts or immediate action—there was no crisis or burning platform. Rather, evidence-based analysis had led to a government position that would require continuous monitoring of the supply situation and incremental and prudent augmentation of water systems as appropriate.

Strategy 2

In June 2007, only eight months after publishing its 2006 strategy, and in the face of a now looming water supply crisis, the mood of the Victoria government had changed. The new strategy, titled *Our Water Our Future: The Next Stage of the Government's Water Plan* (DSE 2007), announced three urgent initiatives. First, work was to commence immediately to plan and construct one of the biggest desalination plants in the world (with a capacity of 150 GL per year) at a site already chosen. Second, a major upgrade would be undertaken to improve the efficiency of the irrigation region to the north of Melbourne. This upgrade would save up to 225 GL per year of water, of which up to one-third would be allocated to the Melbourne potable water system, but with the majority of the savings being allocated to irrigators or to the rivers for environmental flows. Third, perhaps the most controversial announcement was that a new interregional pipeline would connect the rural irrigation region to the reservoirs servicing Melbourne.

As with the 2006 document, this new strategy in mid-2007 had a strong evidence base. Reservoir inflows in 2006 had been the lowest on record, and it was projected that if the same rainfall patterns continued, Melbourne would need more than 240 GL per year of additional new water sources by 2011 to avoid running out of water. The desalination plant's additional 150 GL and up to 75 GL from the irrigation savings were the main options chosen to provide this additional new water.

Most people in Melbourne knew that dramatic action was needed to increase water security. The evidence of need was strong, and the urgency seemed incontrovertible. However, considerable political controversy surrounded the strategy, for two significant reasons. First, the new strategy and its ambitious new options had not been subject to public consultation or independent and public peer review. Second, other options such as demand management, recycled water, a new reservoir, rainwater tanks, stormwater capture, and even pricing reform were seen by some informed critics as realistic and more sustainable alternatives. Behind the scenes, public sector analysts had examined all these options through internal advisory processes, and they had concluded that these options could not provide the amount of new water needed in the time available to deliver solutions. However, the details of this analysis had not been shared with the public prior to the policy announcements being made.

While the strategy was sound in a scientific sense, the projects were unpopular with many sections of the public and with the government's political opponents, especially because a comprehensive community engagement process had not been undertaken around various options. Even some in the irrigation community who were to profit materially from the new capital investment were opposed to the strategy.

This controversy occurred in a context in which political imperatives were dominant—there was certainly a burning platform, the strategy was very clear, and the solutions were bold. It was also an evidence-informed strategic response. However, because the strategy decisions did not involve a comprehensive and timely community engagement process, the strategy was not universally acclaimed.

A Water-Sensitive Future for Melbourne

I argued earlier that several major challenges and trends—such as climate change, new technologies, rapid urbanization and demands for greater citizen participation—are making strategic planning processes more complex. In order to deal with these new demands, there is evidence that a new hierarchy of stages for city planning is emerging. Work undertaken by the International Water Association's Cities of the Future program (see http://www.iwa-network.org/programs/cities-of-the-future) proposes the following:

- First, the engagement of citizens and stakeholders in processes aimed at achieving shared ownership of a vision for their city and the development of key outcomes that would give meaning to that vision. These processes would include a "whole of government" collaborative perspective, across agencies and across levels of government.
- Second, the integration of water-related aspects of urban design with other policy domains (e.g., housing, health, energy, transport), supporting the achievement of the key outcomes of resilience and livability.
- Third, the development of water system solutions that deliver these key outcomes. This requires integrating water systems planning with city planning at the highest level, not tacking on water solutions at the end of the process, as was typical in earlier times.

Nearly a decade after the controversial 2007 water strategy, the Victoria State Government released a discussion paper on *Water for Victoria* (DELWP 2016) that is underpinned by this new approach. The paper has been developed in the absence of a water crisis—there is no burning platform to drive high-level political action. Arguably, this might assist in calmly developing a well-rounded and flexible approach.

The focus of the discussion paper is subregional plans that have, as their starting point, consultation between water authorities, local governments, and citizens to identify the desired livability outcomes for local areas and then to identify how innovative water systems could contribute to such outcomes, including through better integration of "top-down" centralized policy and infrastructure with "bottom-up" initiatives.

In this respect, the discussion paper process is at a critical point. It proposes a strategic framework that will build resilience into the ongoing development of urban and water systems in an attempt to avoid the crisis responses that were deemed necessary in 2007 in the Murray-Darling and Victoria strategies.

But while this process is set up to address the complexities of whole of government and interdisciplinary planning—and while adequate time exists to undertake authentic consultation on the strategies—the lack of a crisis may pose challenges in concentrating the minds and energies to deliver bold and innovative solutions.

Time will tell whether the new processes (analytic and bureaucratic) will be sufficiently developed and accepted by the broader community to avoid the dramatic decision-making processes of 2007 should another "millennium drought" emerge in the near future.

Concluding Observations: New Leadership Styles

Water strategies throughout the world are being developed to deal with major environmental, social, and economic issues that can provoke passionate and divergent points of view. Resolving these differences is complex enough in situations where water security and climate conditions are regarded as fairly predictable and manageable. The cases discussed here illustrate that successful strategy development is highly dependent on authentic citizen engagement being undertaken within an adequate time frame.

Coping with increasing complexity while engaging with a full range of stakeholders and the community demands a new approach to leadership and governance itself. Developing a shared vision of the livability outcomes of a city is an exercise that requires water planners to take off their technical problem-solving hats and engage in authentic stakeholder discussions as a first step of any planning exercise.

Water planners (and others involved in planning processes) need new skills in active listening and constructive cultural behavior, and all agencies need to recognize that thinking and acting only in the interests of their own silo of responsibilities will inevitably produce suboptimal outcomes. Of course, this applies just as much to political decision makers as to public sector bureaucrats. Leadership focused on constructive behavior that recognizes and rewards generosity of spirit across disciplines and between organizations is the foundation of this new approach.

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