

ACHIEVING WATER SECURITY IN AN UNCERTAIN FUTURE

The Australian Water Association (AWA) recently released a discussion paper 'Water Security for all Australians', highlighting the critical need to focus on securing water supplies for the future social and economic development of the country, particularly in the face of the challenges of a changing climate and population growth.

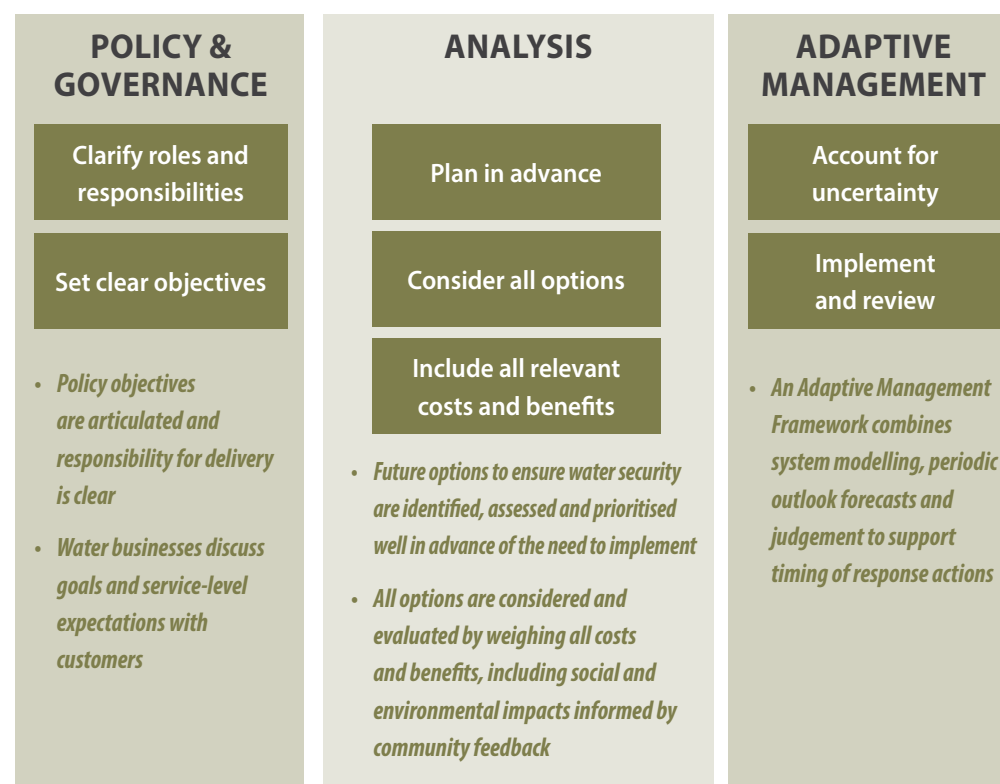
Urban water management became a prominent issue during the millennium drought, when growing concerns over water security led to major investment in new supplies across Australia. Six major desalination plants were constructed in Australian cities between 2006 and 2012. However, these supply augmentations, combined with above-average rainfall in many areas between 2010 and 2012, provided an immediate sense of water security and reduced the policy focus on urban water issues.

As outlined in our recent Think Piece (*Driving urban water reform*), emerging challenges are shifting attention back towards ensuring water security for a rapidly growing urban population. Dropping storage levels have tested – for the first time in some instances – decision-making about the timing and extent of water to be provided by climate-independent supplies with higher operating costs, like desalination. As these resources are increasingly drawn upon, secure and affordable water supply into the future also depends on clearly understanding triggers for the next supply augmentation or demand management options.

The challenge for the urban water sector is to minimise the costs of maintaining an appropriate level of supply security, while accommodating the uncertainty and pressure placed on urban water supplies by population growth and climate variability. Achieving an efficient level of investment in water supplies is in everyone's interest, given that the costs of building and operating infrastructure will eventually be passed on to urban residents, either directly as higher water bills, or through higher taxes or reduced government spending in other areas.

This Think Piece describes the elements (summarised in Figure 1) that Aither considers will support efficient planning and delivery of secure, affordable urban water supplies.

FIGURE 1. KEY ELEMENTS IN PLANNING AND DELIVERING WATER SUPPLY SECURITY



Ensuring division and clarity of responsibilities

The separation of policy-making, regulatory oversight and service delivery roles in the urban water sector was set out as part of the 1994 COAG Water Reform Framework. This made clear the responsibility of governments to articulate clear, measurable and coherent policy objectives, with water authorities provided the autonomy and incentives to deliver while monitored by, and accountable to, independent regulators.

The integrity of these arrangements is a key foundation for urban water supply planning and delivery. Ensuring each party is clear about its role, and has the capability to deliver it, supports a well-functioning system – particularly when challenged by extreme circumstances such as drought.

Set clear objectives

Planning future supply security requires clear articulation of objectives, ranging from expectations of reliability to broader goals for water resource management at the policy level. There is an increasing emphasis on informing and empowering the community, as customers, to have greater involvement in determining the levels of service they receive. Victoria's Essential Services Commission has recently released a Position Paper, *A new model for pricing services in Victoria's water sector*, which outlines one approach to giving customers a greater say.

Clear and measurable supply security objectives, preferably informed by an engaged community who understand the trade-offs involved, is a necessary basis for planning future actions and investment.

Plan in advance

The uncertainty inherent in traditional, climate-dependent water supplies means that planning future supply security must consider a wide range of eventualities. In an increasingly variable climate, this scenario-planning includes being prepared for conditions that may be outside those reflected by the historical record.

“Planning future supply security must consider a wide range of eventualities.”

Combatting uncertainty requires a balance between sophisticated modelling and adaptive management (discussed below) and being sufficiently prepared for a range of future outcomes. Adequate planning of future options in advance of their immediate need:

- allows time for analysis to better inform decision-making
- increases the range of options likely to be available
- reduces the risk of ad hoc responses that may be sub-optimal
- provides greater opportunity to stage and stagger a number of options, rather than large, lumpy investment.

There is value in investigating and developing many options, even if some are not subsequently implemented. Ready options for implementation in the absence of time pressure is typically less expensive and provides the ability to respond from an informed and prepared position when prevailing conditions require action.

Consider all options

Preparedness for future action should include considering all available options, regardless of perceived social or political favour. Application of a robust but simple evaluation framework, incorporating a range of criteria, can readily prioritise options for more detailed investigation. Rapid assessment of option long-lists, accompanied by more detailed economic evaluation (such as cost-benefit analysis) of prioritised options, supports robust decision-making. Demonstrating that a breadth of options has been considered provides transparency and gives confidence to regulators and customers that future investment is informed and efficient.

Consistent with the prevailing paradigm of integrated water management, a wide range of alternative water sources can be considered in balancing urban water supply and demand. However, options should not be limited to supply-side augmentations or infrastructure solutions. Demand management measures and the role of water restrictions are also important to consider as part of a portfolio of options (including as a short-term response to extreme events). As supply systems become increasingly inter-connected with a greater diversity of sources, there are also more opportunities to consider how existing arrangements can be optimised.

Some options – such as scarcity pricing, or using recycled water in the potable system – may be politically unpalatable at a point in time. Putting these options on the table at least facilitates open and transparent comparison that may contribute to productive debate about the need for such options in the future.

Include all relevant costs and benefits

Evaluation of short-listed options should consider all costs and benefits, not simply financial impacts. For example, the environmental impact of a new dam, or the impost of water restrictions on users of public open space, reflect costs of these options that must be acknowledged. Many social and environmental impacts can be challenging to quantify and are therefore often ignored, but there are economic approaches that can be applied to ensure the full range of costs and benefits is included in decision-making.

Account for uncertainty

Modelling will play a key role in optimising supply security, and it is important that a wide range of possible scenarios is considered to account for the uncertainty in projections of both climate (supply) and population (demand). Scenario planning based on the best available information will support informed, risk-based decision-making.

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A number of modelling approaches is available, ranging in detail and sophistication. Selecting an appropriate approach will depend on individual system attributes and complexity; the level of detail adopted becomes especially important where there is flexibility around the timing of irreversible decisions and the potential to learn over time, giving rise to ‘real options’ values.

The triggers for future augmentation should be expressed alongside a risk-based strategy in place to manage periods of climate extremes.

Implementation & review

Modelling supports implementation of an adaptive management framework, which places planned actions and triggers in the context of prevailing conditions. Regular monitoring of system conditions (storage levels, inflows and seasonal climate outlook) should trigger prioritised short-term and longer term actions as part of a clear, risk-based strategy.

Conditions are never static. While actions to guarantee water security should be based on long-term planning horizons, a periodic strategic review is necessary to ensure analysis and assumptions remain relevant.

Conclusion

The lessons learnt from delivering secure water supplies in a challenging climate mean that Australia’s water businesses are well positioned to maintain this essential service. However, as such challenges continue to intensify, there is scope to further improve preparedness and ensure that water security is provided in an efficient, affordable and sustainable manner.

Aither’s services align with every step of the process described, from strategy development through to sophisticated economic modelling and adaptive planning. We look forward to further supporting water businesses and governments in delivering water security effectively and efficiently, and welcome the opportunity to discuss how we can assist.



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