The Urban Water Crisis and the Governance of Uncertainty

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The water crisis in Australia – rural water background

- There has been a very long drought in many parts of Australia. This seems to be linked to shifting patterns of lower rainfall and climate variability.
- **Rural** waterways have been badly affected, with impacts on
  - river health and biodiversity;
  - availability of irrigation water for agriculture
- State and national governments tried for 30 years to develop a cooperative approach to managing the stresses of our major river system, but with little success (e.g. Murray-Darling Basin Ministerial Council).
Urban water - background

- The recent drought has also focused attention on water supplies and water use in cities and towns.
- Small inland towns, being dependent on depleted rural river flows, have suffered badly.
- Large cities water storages have fallen to alarmingly low levels in recent years, provoking a political crisis.
- More generally, water has become a critical issue in public policy.
International trends similar

• Throughout the world, old water infrastructure has no longer managed to deliver sufficient water supplies in many areas of high demand.

• This has been caused by four main trends:
  – changing patterns of rainfall in catchments;
  – over-allocation of irrigation water from rivers and dams;
  – depletion of groundwater aquifers; and
  – increased population pressures.

• Is this a genuine crisis? If so, is it best remedied by technology? or by better long-term policies and practices around sustainability?
Water infrastructure no longer adequate!!
A ship loaded with drinking water is seen docked in the northern Spanish port of Barcelona as part of an unprecedented emergency plan to alleviate a drought in the city. The ship was carrying 5.3 million gallons of water.
Australian cities – new responses required

• City water storages in Australia, except in the tropical regions such as Darwin and Cairns, have recently been at historical low points.

• Provision of reliable and safe drinking water has become a major issue in Australian cities.

• The national government has established a National Water Commission which develops strategic national frameworks for efficiency and effectiveness in water supply and water use for both rural and urban water.

• It has recognised the need for enhanced attention to urban water: [http://www.nwc.gov.au/](http://www.nwc.gov.au/)
Southeast Queensland - decline in water stored in three SEQ dams 2003-2007
Southeast Queensland – case-study

• SEQ is based on the capital city Brisbane and a region of 22,000 square kilometers.
• In response to the urban water crisis, the water planning role of local authorities was abolished.
• Instead, a new statutory body, the Queensland Water Commission, was recently established, in order to oversight and regulate urban water supplies and water planning: see http://www.qwc.qld.gov.au/
• The Queensland Water Commission has released a draft Water Strategy for the region, expected to be finalised this month – see http://www.qwc.qld.gov.au/SEQWS
Responses to drought in Southeast Queensland (SEQ)

- Growing sense of crisis owing to recent low rainfall, and the risk of ongoing low-rain trends and major variability in climate.
- Hence, urgent consideration was given by the Queensland government and the new Queensland Water Commission to tighter measures.
- These include:
  - Demand side measures
  - Supply side measures.
Responses to drought in SEQ

1. **Reducing water consumption through demand management**: e.g. through
   - higher prices;
   - better metering of water usage;
   - restrictions on certain water uses;
   - installation of water-efficient devices into domestic and industrial buildings;
   - developing sectoral responses for household and industrial usage;
   - however, rejection of notion that demand management alone could largely meet the crisis conditions.
Responses to drought in SEQ

- 2. establishing alternative and supplementary water supplies: e.g. through
  - new dams;
  - increased capacity of existing dams;
  - new pipelines to form a “Water Grid”;
  - new facilities for desalination;
  - new facilities to purify waste water for recycled uses; and
  - incentives for domestic rainwater tanks (subsidies by state & local authorities).

- These measures are widely seen as the primary focus of “urban water security”.
Potential water grid for moving water between storage facilities in South East Queensland
Purpose of research project

• Focus is the response to the emerging water supply “crisis”.
• Conceptual interest in whether this is a water crisis or a governance crisis.
• Key empirical themes are to document the policy frameworks, administrative arrangements and stakeholder engagement for urban water supply.
• We are examining the evolving “institutional” foundations for building effective and efficient long-term arrangements for water management in SEQ.
• We also want to compare SE Queensland with other metropolitan areas internationally.
Research focus

“Institutional” and policy focus also includes:

• Documenting the changes since 1980s in the roles and responsibilities for water planning & management.

• Understanding how the focus of water policy changed over several decades – e.g. floods in 1974, catchment management in 1980s, allocation assessment in 1990s, recent focus on demand management and pricing;

• Evidence and professional knowledge bases;

• Learning and evaluation capacities and needs;

• Behavioural and attitudinal changes;
Research focus (cont)

- Strategic and operational links and relationships;
- Requirements for consultation and partnering;
- Relations between governments, businesses, communities, and individuals;
- Coherence between levels of government (three levels with regulatory impacts in Australia);
- We take a multi-scale approach by looking at how decisions are “nested” in federal – state – regional layers, with their local rules and perspectives;
- Hence we note there are interacting regulatory rules and networks which help or hinder the delivery of multiple water outcomes.
Significance

• The challenge, and urgency, of building these new arrangements is significant, given national and regional re-focus on urban water issues:
  – the rediscovery of urban water issues by the National Water Commission;
  – the role of new Queensland Water Commission, with strong new powers and responsibilities, most notably for “supply-side” water security;
  – re-negotiating and re-designing local bodies’ responsibilities concerning water planning, water quality etc.
Significance (cont)

• The challenge of the rapid pace of change management required

• The challenge of developing smart inter-organisational relationships, not just the business success and organisational excellence for a new regulatory body.
Types of knowledge affecting decision-making

- Science & technology
- Community attitudes
- Management capability
- Coordination of inter-related issues
Management and Leadership Challenges

- Goals and objectives
- Structures & authority
- Operating processes
- Roles & relationships
Who is responsible for specific tasks? And is anyone responsible for whole-of-system issues?
What are we drinking? The “recycled water” debate

“Flush then drink”, The Australian, 30 October 2008
Adaptive management – a way forward?

• This approach is a way of dealing with uncertainty and optimising innovation.

• It involves “learning by practical experimentation” to determine the best management strategies, i.e.
  – “learning by doing” with rapid adjustments
  – “learning to manage by managing to learn”.

• Technology is seen as a major contributor to solutions, but not as providing sufficient and definitive solutions.

• Participatory networks – of experts and stakeholders – are vital for understanding and responding effectively to complex issues.
Adaptive management

• The adaptive management approach to “learning by doing” involves:
  – iterative decision-making (evaluating results and adjusting actions on the basis of what has been learned)
  – feedback, monitoring, evaluation and decision-making (learning)
  – recognising system uncertainty through multiple models
  – embracing risk and uncertainty as a way of building understanding
  – this can be seen as politically risky.
Adaptive vs crisis management

• Political-crisis responses often emphasise tangible “decisive action” rather than long-term sustainability.
• This adaptive approach seems very necessary for dealing with water policy adjustment and the innovation challenges arising from climate change.
• This framework recognises uncertainty and the need to work simultaneously on connected issues such as:
  – Climatic variations
  – Public health issues
  – Ecological management issues
  – A multitude of competing views/interests
  – A mix of regulatory and market mechanisms.
Key features of wicked problems

• Problems are inherently difficult to clearly define and are framed in divergent ways
• They contain many interdependencies and multi-causal relations
• The problems are socially complex with many stakeholders
• Entrenched value differences are significantly involved in many problem areas
• The problems may be unstable and keep evolving
• The knowledge base for defining problems and possible solutions is patchy and disputed.
• ‘Rational comprehensive planning’ will fail.

[ adapted from Rittel & Webber 1973 ]
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