Assessment of Alternative Water Options in Adelaide: The MARSUO and Optimal Water Resource Mix Projects

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- Established 2010 to support the security and management of South Australia’s water supply and contribute to water reform in Australia.
- A partnership between the South Australian Government’s Department for Water, CSIRO, Flinders University, the University of Adelaide, and the University of South Australia.
- Goyder Institute Associates in 2010-11 were the South Australian Research and Development Institute (SARDI) and SA Water’s Australian Water Quality Centre (AWQC).
Literature Review into water reuse

Non-potable water reuse
Community generally accepts recycled water for non-potable uses

Indirect potable water reuse
1: Mount Gambier, South Australia-120 years
2: Orange City, New South Wales- 2 years
3: South East Queensland Purified Recycled Water Scheme - “highly controversial”
   Plus recent flooding events
Community attitudes to indirect potable reuse in Adelaide

- Is stormwater after managed aquifer treatment and reservoir storage acceptable for potable uses?
- What does the community want to know to help them decide?
- What practices and processes will influence community support?
Methods 1

Focus groups:
N= 36 in 4 groups
- Pre-test,
- Education session,
- Discussion,
- Post-test - one month later for the 19 who gave contact details
Methods 2

• **Survey:** online 20mins;
  (i) current water supply
  (ii) water supply options for stormwater & MAR
  (iii) willingness to pay,
  (iv) treatments
  (v) future water supply factors e.g. financial, environmental impacts, health & safety etc, drought & non-drought conditions

• **Sampling:** ORU - Online Research Unit - sample of n=1114, database of 300,000

• **Analysis:** behavioural psychological approach - qualitative & quantitative responses
A non-potable stormwater option

1. Stormwater
2. Treatment Plant
3. Community Household

Note: Allows only for toilet flushing and laundry as well as garden irrigation (Using new separate pipe system)
Two potable stormwater options

1. Stormwater
2. Wetland
3. Aquifer

Community Household
(Using existing water mains distribution system)
Comparison of Informed and Uninformed Responses

• Focus group pre-test: 29% said they knew nothing about groundwater replenishment.
• 80% of the focus group participants said the presentation in the focus groups was very informative or extremely informative.
• Focus group attendees agreed that it had influenced their opinions about stormwater reuse.

Thus:
• Focus group attendees more informed than survey respondents
• Of course water scientists far more informed
1. Greater Acceptance of Groundwater

Focus groups
Support for using stormwater for groundwater replenishment,
• Pre-test: 34% supported the use, 43% no opinion.
• Post-test: 93% supported the use

(Within subjects analysis: n=19, Mean difference = 0.53, Std Deviation = 0.84, p < 0.05).
2. Focus Groups versus Adelaide-wide Survey

Contrast 1: Support for Options 2 & 3 - adding stormwater to the drinking water supply.
- Focus groups: 97% support
- Survey: 70% support, 20% would maybe protest.

Contrast 2: Support for Option 1 - third pipe for non-potable water
- Focus groups: 25% supported with 65% undecided
- Survey: 80% support

Note: 97% of focus group had moderate confidence in SAWater to manage the water & 94% in their transparency
3. Failure to Distinguish between Options 2 and 3

- Neither focus groups nor Adelaide-wide survey, could distinguish between the potable Options 2 & 3.

- Scientists strongly support the benefits of multiple barriers therefore preferred Option 2

  - **Option 2** was wetland → aquifer→ treatment plant → reservoir→ treatment plant → drinking.

  - **Option 3** was wetland → aquifer→ treatment plant → drinking.
Importance of diverse water sources

How important is it to rely on these water options?

- Very important
- Important
- Unsure
- Unimportant
- Very unimportant

Options:
- Murray River
- Mt. Lofty reservoir
- Desalination plant water
- Recycled wastewater
- Stormwater
- Rainwater
- Groundwater

Drought vs. Non-drought
Significance and Impact

• Solving Adelaide’s water problems requires the creative integration of a number of water sources.
• Stormwater and managed aquifer recharge are likely to be very important
• Community engagement & education
• Trust & transparency
• Independent monitors, public exhibitions, testing kits, etc should be considered
• How water is managed may be more important than its sources
Optimal Water Resource Mix project

- OWRM developed by Dr Maheepala from CSIRO
- Funded by the Goyder Institute
- A research team from CSIRO, Flinders University, the University of Adelaide, and the University of South Australia
- Six tasks: Stakeholder engagement, Water quantity and quality, Household usage, Legal and governance, Economic analysis, Social analysis
- These all feed into a multi-objective decision analysis
- Begins July 2012
Last words from the participants

“I had no idea, but once it was demonstrated, you think, OK well it makes sense, and if it comes out clean and all different various uses for it. So I don’t understand why it's not really going ahead, considering that water is an issue here”

“I don’t really have an opinion yet, but if it's drinking quality, why not drink it”.

“Where's the proof that this is good for me? - you need tests, you need evidence – and where do you get that from, that’s the question. Is it the scientists?”

“Reuse, well it couldn’t be any worse than the stuff out the tap. I don’t drink that stuff out the tap. I believe recycled water is used in many cities around the world; otherwise they'd have inadequate supplies”
References

