



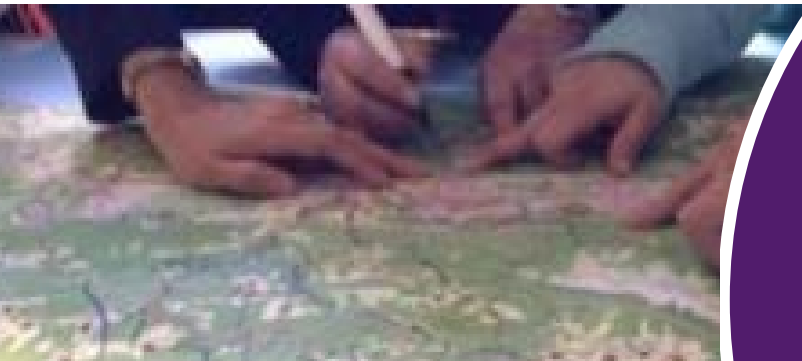
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Water Frontiers: Strategies for 2020 and beyond

Sandra Ryan and Aaron Burton, WATEFCON16

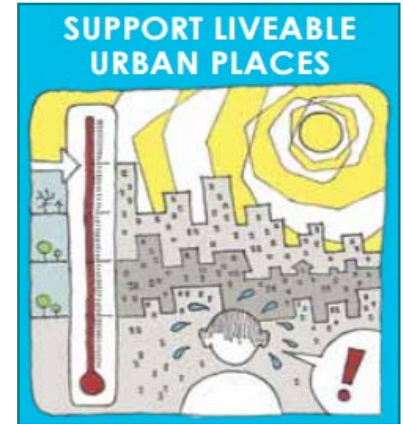
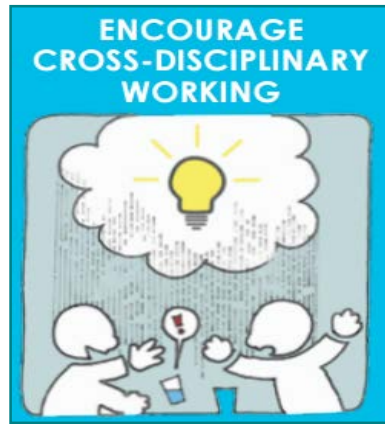
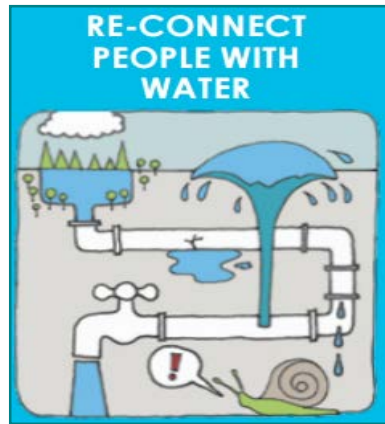
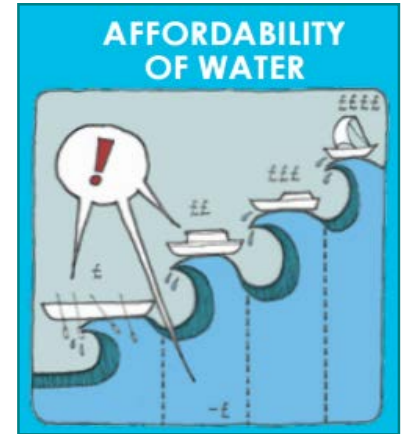
Integrated water planning





Why???

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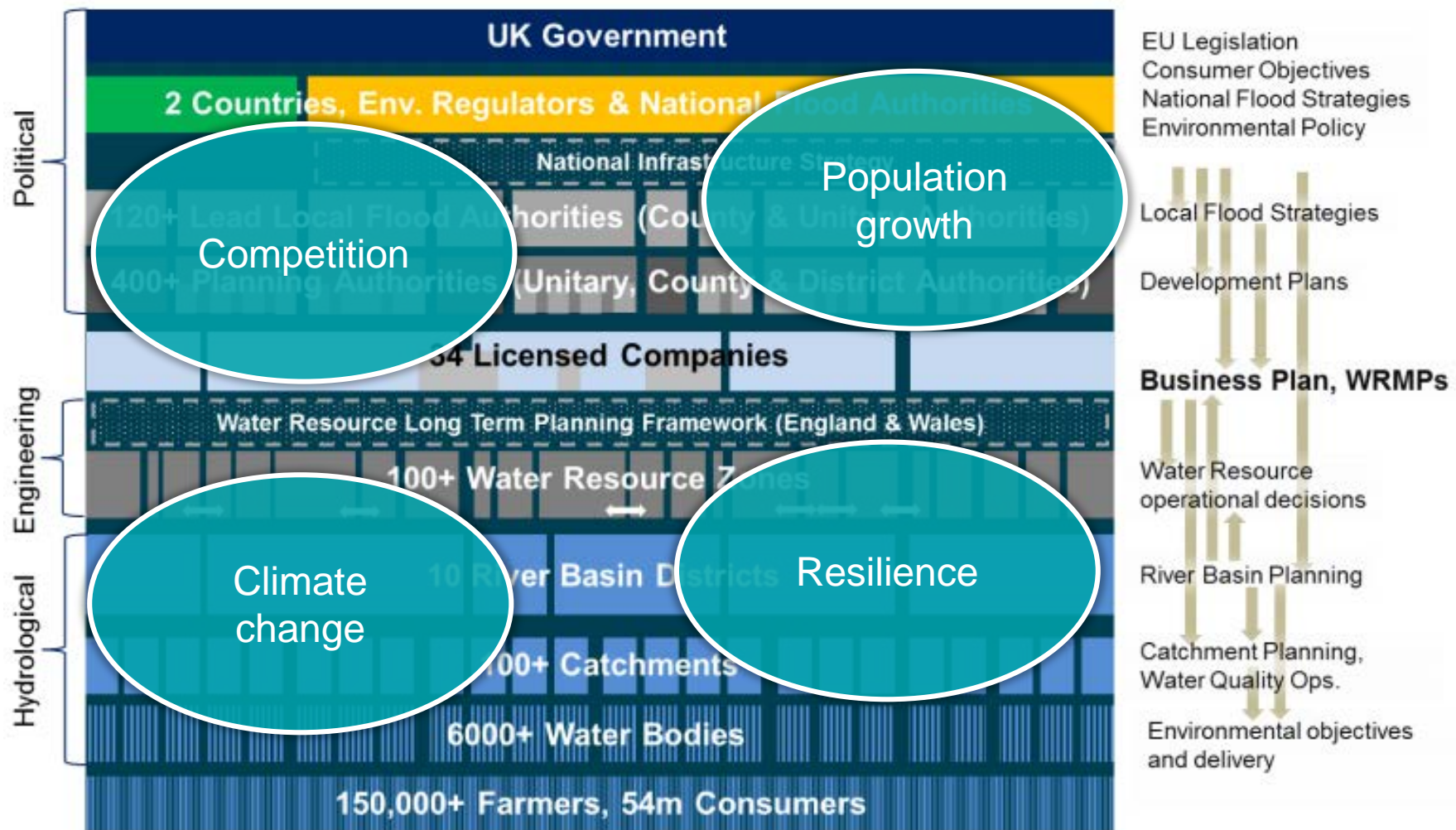




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Current water sector planning

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Our Research

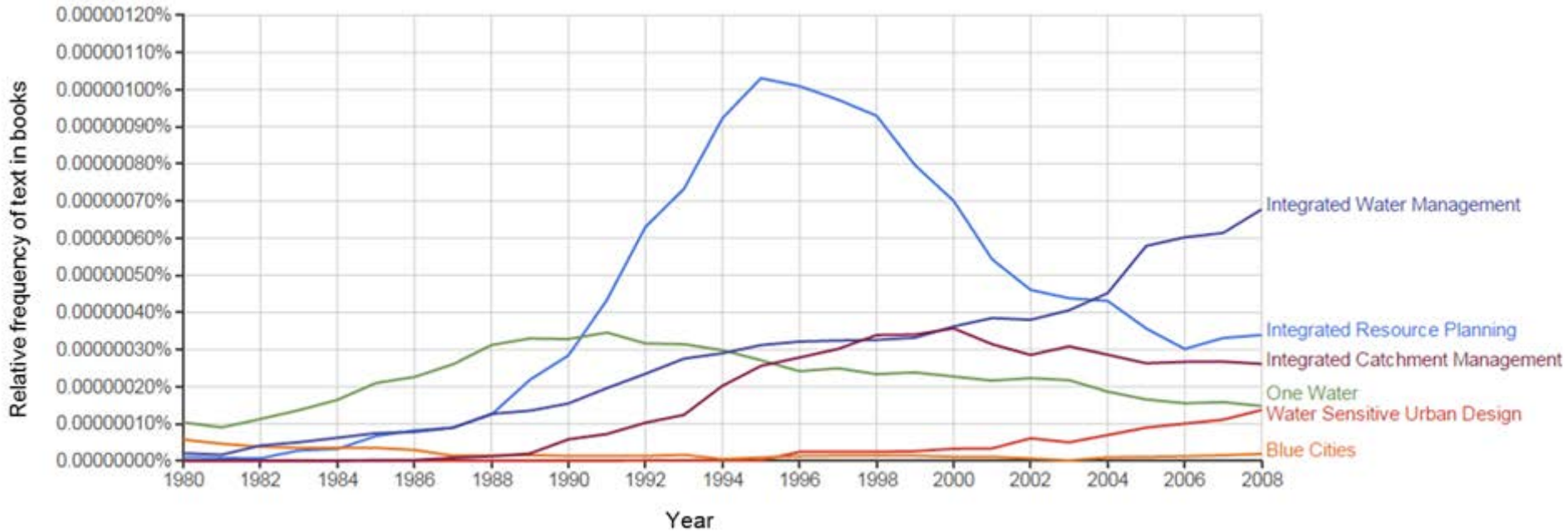


- **Literature review**
 - Journals and grey literature
- **Keyword analysis**
 - Google Ngram viewer (references in google books 1980 to 2008)
 - Google search analytics (2004 to present)
- **International Case Studies**
- **Interviewed 5 water company planners**
 - Semi-structure interviews 20-60min
 - Transcripts coded and analysed





Google Ngram analysis



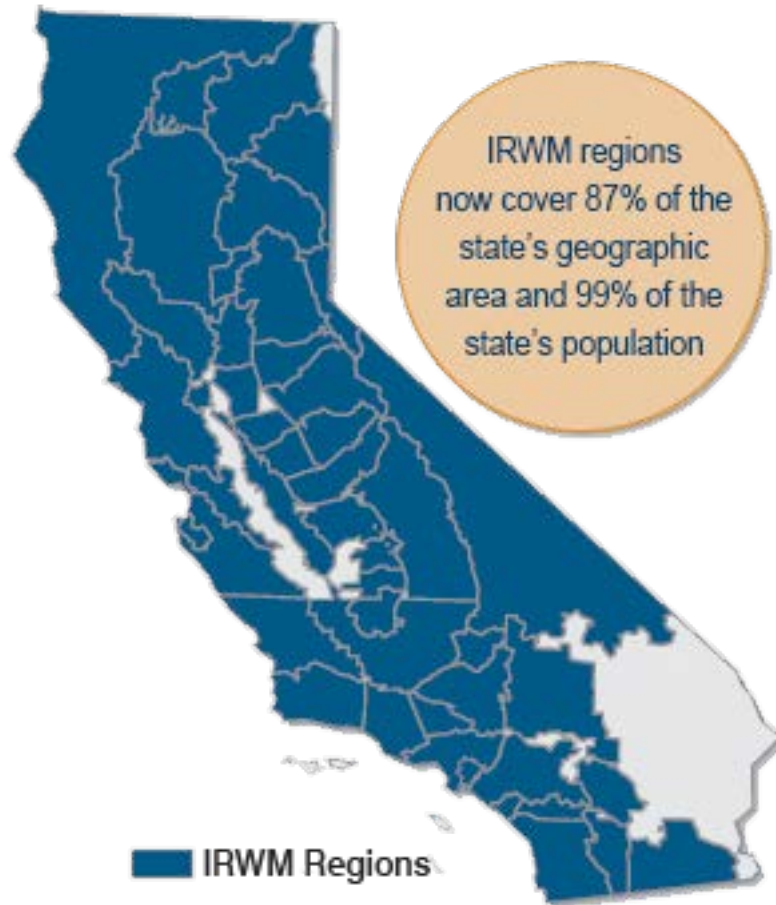


Approaches reviewed

- **Integrated Regional Water Resources Management**
- **Regenerative Infrastructure**
- **Integrated Water Resources Management**
- **Total Water Cycle Management**
- **One Water**
- **Blue Green cities**
- **Water Sensitive Urban Design**
- **Blue Cities**
- **Fourth generation of water infrastructure**
- **Integrated resource planning**
- **Integrated water cycle management**

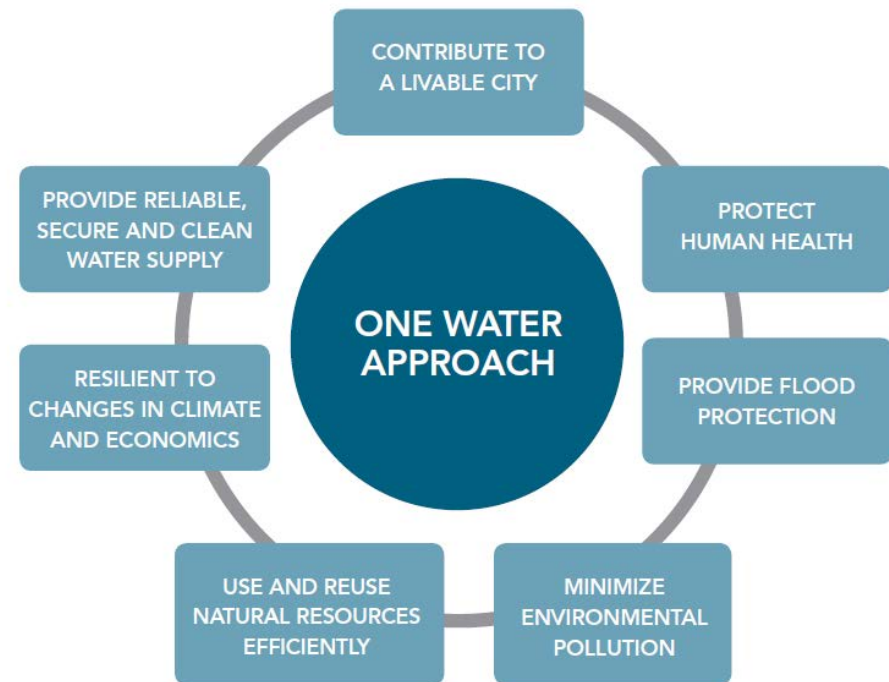
Approaches – Integrated Regional Water Management

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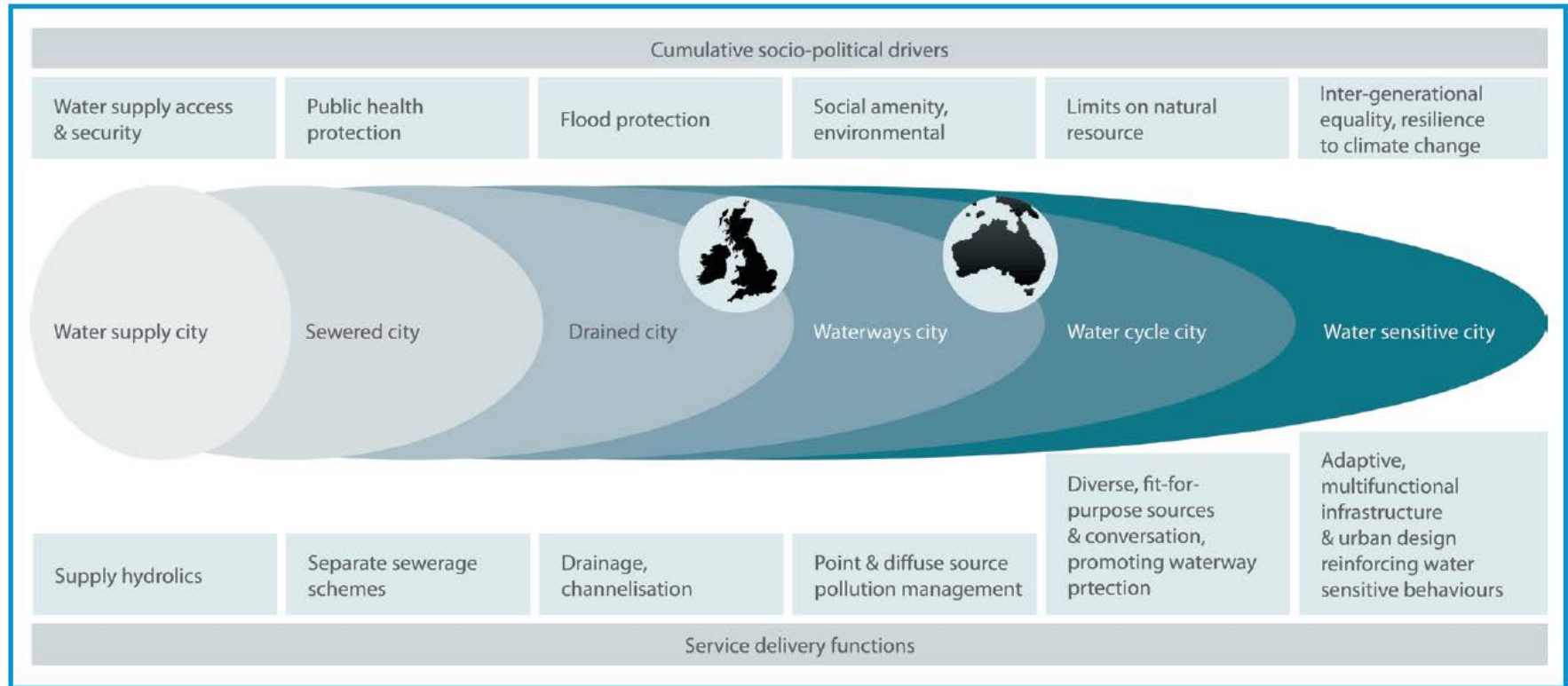
Approaches – One Water





Approaches – Water Sensitive Cities

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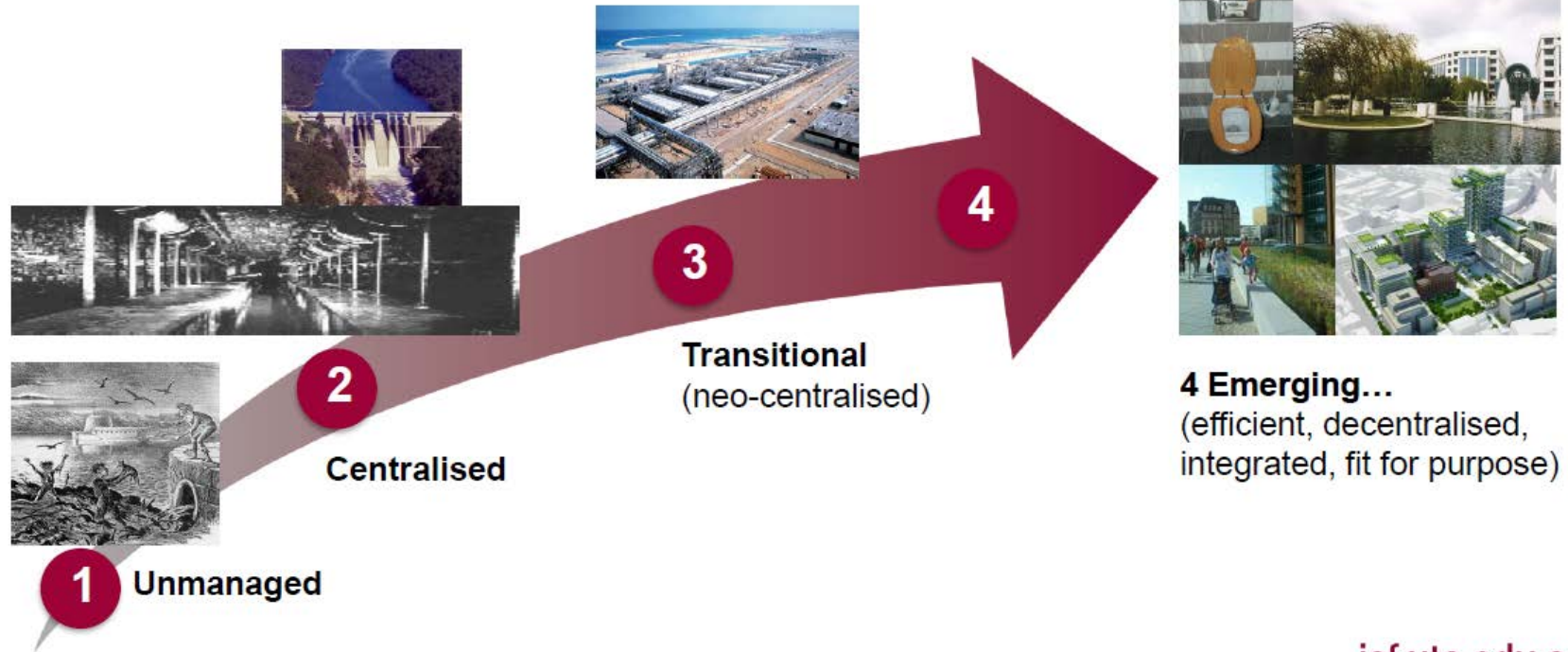
Approaches – Fourth generation water infrastructure

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Future proofing:

Four generations of water infrastructure



isf.uts.edu.au

Approaches – Integrated water cycle management



	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 5
	<ul style="list-style-type: none"> • Rainwater tank on each property • Targeted stormwater runoff management • Sewer flows to the existing system • No reticulated recycled water 	<ul style="list-style-type: none"> • No rainwater tanks • Regional treatment and recycling • Minimal stormwater runoff management 	<ul style="list-style-type: none"> • No rainwater tanks • Targeted stormwater runoff management • Regional treatment and recycling 	<ul style="list-style-type: none"> • Rainwater tank on each property • Targeted stormwater runoff management • Regional treatment and recycling 	<ul style="list-style-type: none"> • 'DEFAULT' TRADITIONAL OPTION • No rainwater tanks • Sewer flows to the existing system • No reticulated recycled water • Minimal stormwater runoff management
SEWERAGE					
Reticulated Sewerage	✓	✓	✓	✓	✓
Transfer to Existing Sewerage System	✓	x	x	x	✓
Local Treatment and Recycling	x	✓	✓	✓	x
WATER SUPPLY					
Reticulated Potable Water Supply	✓	✓	✓	✓	✓
Reticulated Recycling Water Supply	x	✓	✓	✓	x
Rainwater Tanks with Onsite Reuse	✓	x	x	✓	x*
STORMWATER					
Catchment Scale Flood Protection	✓	✓	✓	✓	✓
Stormwater Quality Treatment	✓	✓	✓	✓	✓
Targeted Runoff Volume and Frequency Reduction	✓	x	✓	✓	x

- Traditional Option
- Recycled Water Option
- Integrated Options

*30% of households



Interview Results

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- **Definition**

- Holistic asset planning, water cycle and catchment management
- Synergy solutions needed for wider pressures

- **Existing work**

- Integrating teams under wholesale/ retail split
- Catchment management and water cycle approaches

- **Barriers**

- Fragmented nature of planning and upstream competition
- Different expertise
- More research needed to move beyond voluntary approach

- **Benefits**

- Optimised planning delivering multiple benefits
- Identify and demonstrate trade-offs

- **Awareness of wider concepts**

- Some awareness of Californian examples - suggested this lies with R&D/ innovation teams

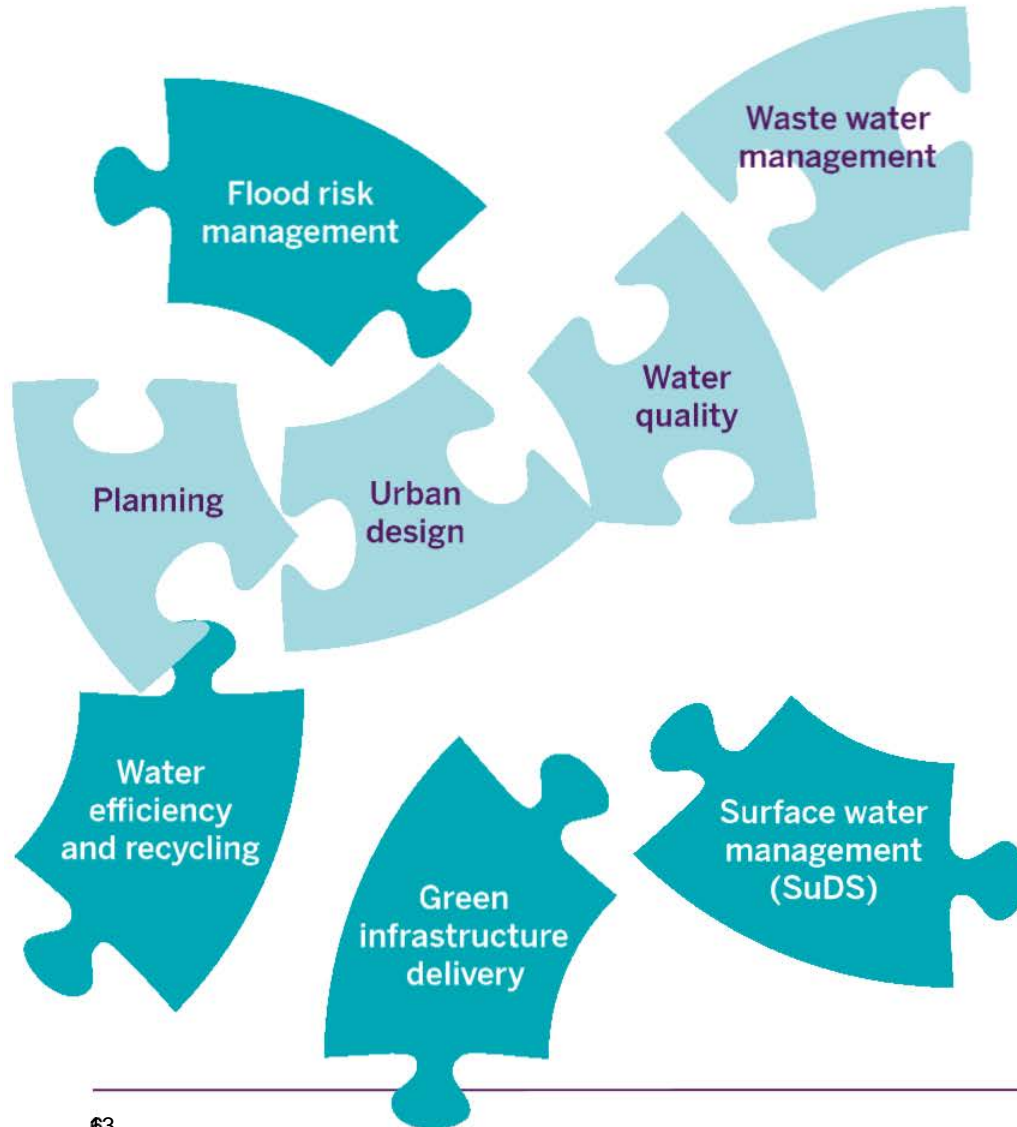
- **Who should take the lead**

- Government – overarching and at least facilitation. Bottom up approaches in California
- Water companies – own challenges compared with the regulator-response model that drives siloed based approaches



Why Integrate?

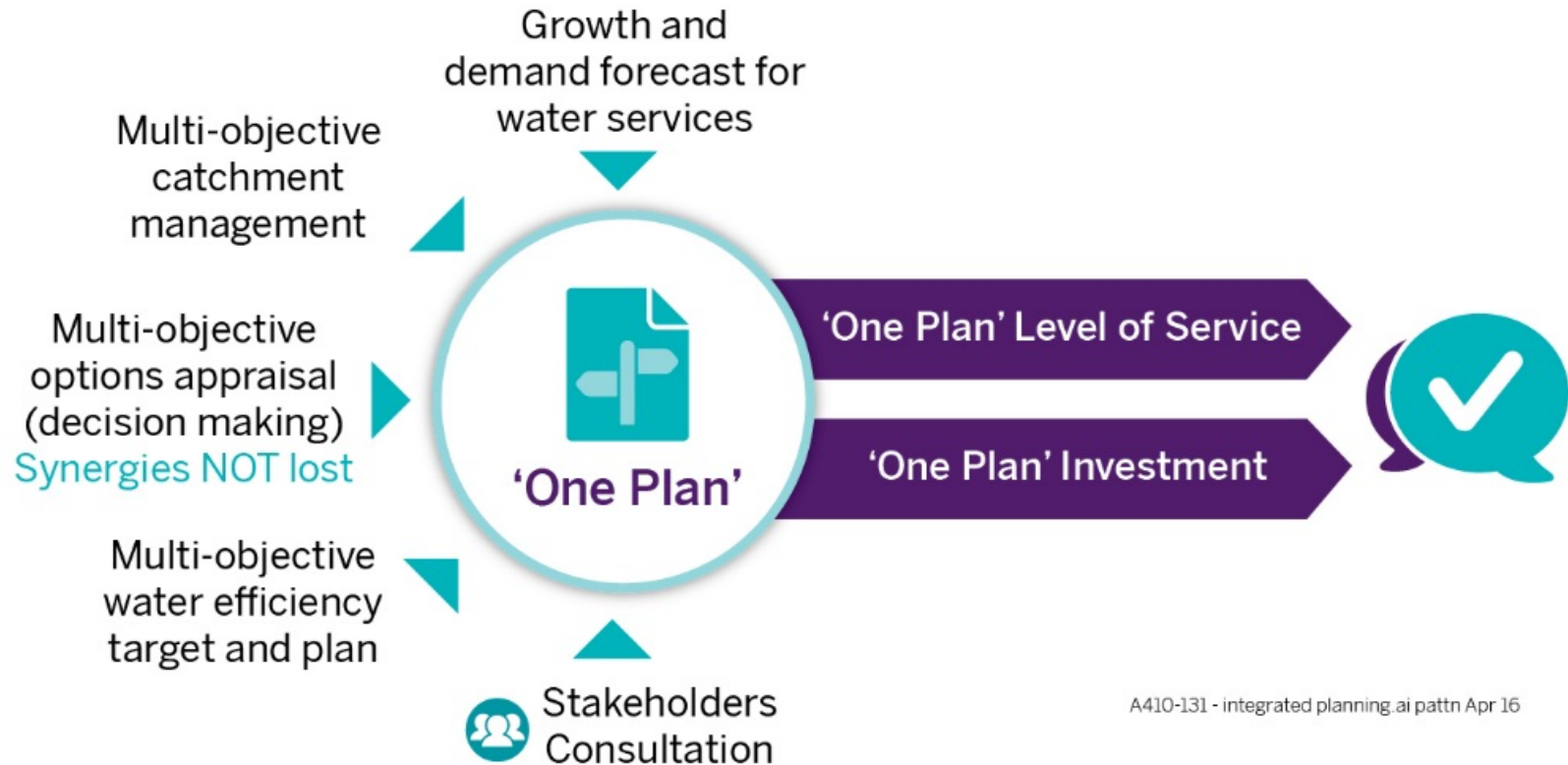
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One Plan Approach

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A410-131 - integrated planning.ai pattn Apr 16



Conclusions

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- Short term “tweaking” of the system and integration in pilot catchments
- Variation in definition and terminology of integrated water planning – seen as academic and conceptual by practitioners
- Beyond 2020 evidence needed to support Government regulation/ facilitation of integrated planning towards “One Plan”
- Future research can expand on this paper using questionnaire and applying international concepts to pilot catchments in the UK

Thanks, any questions?



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