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# WATER RESOURCE SUSTAINABILITY


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# Scope

- Introductory remarks
- Author biography
- Paper on Water Resource Sustainability
- Closing remarks
- Discussion

# Introductory Remarks

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- Engineers Australia congratulates JSCE on its centenary as a leading international engineering organization that echoes its mature engineering outlook
- ACECC organizations' outlook, influence and civil engineering focus have changed over time towards a more outward humanitarian global perspective in promoting a culture for sustainability

# Introductory Remarks

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- Engineers Australia congratulates JSCE on its centenary
- The influence of the Jakarta Protocol
- The growth of ACECC
- The adoption of the theme of ‘Civil Engineering for a Sustainable Future’ from an Engineers Australia perspective

# Author Biography

- Professor Tony Wong MIEAust CPEng
- Chief Executive Officer of the Cooperative Research Centre for Water Sensitive Cities
- Received the prestigious Engineers Australia Sir John Holland Civil Engineer of the Year award in 2010
- Highly experienced in national and international consulting, research, and academia
- Has led a large number of award winning national and international urban design projects

# Creating sustainable, resilient and livable cities and towns

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- Long term productivity, prosperity and livability of cities are fundamentally underpinned by the sustainability (carrying capacity) and resilience (coping capacity) of these cities
- The quality of living in these environments defines its livability (comfort capacity)

# The grand challenge in cities

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- Australian cities generate 80% of net national income and they are also where most Australians work and live. Their amenity/livability are important in attracting the best people globally;
- Cities that are resilient to climate change and able to accommodate population growth will attract economic development;
- effective urban planning, design, implementation and management are critical to economic performance

# Sustainable water management in cities

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- managing urban water exemplifies many of the challenges faced by cities as reflected in recent episodes in Australia of:
  - reduced water supply security caused by droughts and increasing demands attributed to increasing population;
  - increased flood vulnerability; and
  - degrading environmental quality of urban waterways attributed to urban pollution.

# The water sensitive city approach

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- Australia is adopting a water sensitive approach to water infrastructure planning and design in response to recent occurrences of severe droughts and floods in cities
- The water sensitive cities approach to city planning and design offer major direct and indirect economic benefits by adopting a mixture of centralised and decentralised approaches tailored to local circumstances.

# Key outcomes of a water sensitive city approach

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1. Cost effective use of underused/wasted water sources, tailored to end use to increase water supply security;
2. Greater productivity of use of existing infrastructure;
3. Avoided or delayed upgrade or expansion of water supply/wastewater facilities and trunk drainage infrastructure;
4. Lower water charges through reduced input costs to businesses and utility charges to households
5. Reduced flood damage and insurance burdens
6. Reduced community morbidity and mortality from urban heat
7. Avoided or reduced restoration costs to urban waterways and adjoining rivers and bays

# The role of Green Infrastructure

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- A water sensitive approach includes the use of green infrastructure
- Increasing evidence that green infrastructure can deliver a net positive economic benefit to urban communities
- ‘Our cities can provide ecosystem services’
- Network of blue-green corridors to provide supplementary drainage systems for flood conveyance and biodiversity spaces
- Urban heat issue is growing in significance
- State of Australian Cities report predicts that heat wave related deaths will more than double over the next 40 years
- Evidence that green infrastructure can effectively influence the micro-climate in cities and reduce urban heat

# The non-market economic benefits

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- The property values increases attributed to Water Sensitive Urban Design (WSUD) and proximity to green spaces are less that the capital cost of WSUD assets
- The health costs related to the effects of urban heat on community morbidity and mortality can be broadly quantified
- System resilience could be quantified
- There are other economic benefits including increased biodiversity of the aquatic ecosystem, and improved physiological health

# Closing Remarks

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# Discussion

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