

## WATER SENSITIVE URBAN DESIGN FOR RESILIENCE TO CLIMATE CHANGE

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Water Sensitive Urban Design (WSUD) has evolved from its early association with stormwater management to provide a broader framework for sustainable urban water management. It is a framework that provides a method for integrating the interactions between the built form (including urban landscapes) and the urban water cycle. In Australia it is increasingly practiced in new urban Greenfield development areas and urban renewal developments and is a major instrument contributing to the broader ESD agenda.

An emerging challenge to urban communities is its design for resilience to Climate change. WSUD philosophy interacts with Climate Change Management in a number of ways. This paper evaluates several of these interactions, particularly in terms of urban water considerations. *Internal self-sufficiency* of urban environments for resources is considered a key underpinning of building sustainable urban environments that are resilient to climate change. Integrated urban water cycle planning and management provides the platform for water conservation and protection of aquatic environments, centred around considerations of minimizing the import of potable water, minimizing the export of wastewater and optimizing the use of stormwater, and the appropriate scale to best achieve these principles.

Planning for *internal self-sufficiency* of urban environments would include the appropriate proportion of different landuses (eg. Residential, commercial, industrial, open space etc.) within an urban area. These considerations if undertaken rigorously inevitably lead to interactions with energy management. Two obvious interactions of WSUD and energy use involve the balance between the use of urban catchments as water supply catchments and the development of water cycle scale that limits the discharge of wastewater. WSUD incorporating the use of vegetated landscape for stormwater treatment systems and for the discharge of treated wastewater provides the opportunity to influence micro-climates within urban environments.

This paper presents and discusses a number of possible future WSUD scenarios that address issues beyond the traditional objectives of sustainable urban water management as we know them today. By way of hypothetical examples, the authors hope to provide an insight on how WSUD will need to evolve from its current framework to a wider agenda of Ecologically Sustainable Development and resilience to the effects of climate change.