

**2<sup>nd</sup> International Conference on Sustainable Urbanization – Hong Kong**

**January 7-9, 2015**

**ABSTRACT**

*Urban Water Sustainability and Climate Change*

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Water is a vital renewable resource for urban society which is increasingly stressed by multiple demands of water supply for people, industry, and water quality impairments. Changes in water supply and demands for water are driven by population growth and climate change. In this talk, we discuss the effect of climate change on urban water supplies including: changing patterns and amounts of precipitation, groundwater depletion, water quality impairment, and the need for water reuse, while taking a more holistic management approach to the entire water cycle.

Sustainable water infrastructure may require implementation of low impact development measures such as rainwater harvesting, green roofs, rain gardens, permeable pavements, and infiltration basins. Somehow we must increase the rate of aquifer recharge, and reuse water repeatedly. In many cases, it will require recycling the harvested rainwater, either via direct or indirect potable water reuse. Desalination may also be needed in coastal megacities.

Water stress exists in many locations -- wherever we withdraw more water than falls on our footprint, and that includes some “water-rich” locales where groundwater aquifers are being depleted. It is not only a national problem, but a global one. Fortunately, aquifers can be recharged through water conservation. And wastewater can be treated fully to drinking water standards. Still, reused water must be protected from hazardous chemicals and biological agents that can prevent aquifer storage and recovery (ASR) or direct potable reuse. Simply replenishing our aquifers would go a long way towards a more resilient and adaptable water infrastructure.

In this talk, we will discuss real-world solutions to the problems of urban water *unsustainability*. However, mitigation of climate change is the largest looming challenge of the 21<sup>st</sup> century which must be addressed to make real progress on water sustainability.