



Stormwater management to save the rivers and contribute to integrated water management

Professor VEERIAH JEGATHEESAN¹, Ashantha Goonetilleke^{2, 6}, John Van Leeuwen^{3, 6}, Jaya Kandasamy^{4, 6}, Douglas Warner^{5, 6}, Baden Myers^{3, 6}

¹RMIT University, ²Queensland University of Technology, ³University of South Australia, ⁴University of Technology Sydney, ⁵University of Hertfordshire, ⁶Australian Technology Network of Universities (ATN)

Biography:

Jega's research focuses on integrated water management and recently he has co-edited a book on "Urban Stormwater & Flood Management - Enhancing the Liveability of Cities" that is in press by Springer Publisher. Jega is founder and Chairman of the international conference series on Challenges in Environmental Science & Engineering (CESE) held annually since 2008. He has over 300 publications including more than 100 peer-reviewed journal articles and five edited books. Jega is also the managing guest editor of 30 special issues in peer-reviewed journals, an editorial board member of two Elsevier journals and one prestigious open access journal on membranes. Additionally, he is the editor-in-chief of a book series entitled Applied Environmental Science and Engineering (AESE) for a Sustainable Future published by Springer and has been instrumental for publishing 6 books since 2015.

Stormwater is the major non-point source to rivers. For example, it is estimated around 540 billion cubic meter of stormwater flows into Port Phillip Bay annually. Further, stormwater carries 14,000 tonnes of sediment, 650 tonnes of nutrients such as nitrogen from fertiliser, litter, heavy metals and bacteria into the Yarra River each year. In addition, flooding causes shock loading of pollutants to rivers as well as changing the hydraulic regime of the river causing erosion, siltation and bank failure. Major Stormwater management and stormwater quality improvement initiatives such as Water Sensitive Urban Design (WUSD) in Australia, Sponge City in China and Sustainable Urban Drainage Systems (SuDS) in the UK are being increasingly adopted to overcome these growing challenges. However, implementation of such strategies can be localized and may not be integrated with the wider geophysical and social characteristics of the broader surrounding region. There are highly varied approaches towards stormwater management and reuse, ranging from advanced systems such as aquifer storage, transfer and recovery to simple rainfall capture from roofs, with technologies and new approaches in on-going development. This presentation considers some of the major rivers in Australia and the United Kingdom and the impacts of stormwater and flooding. It also evaluates the effectiveness of current management practices in relation to stormwater and flooding for the protection of the health of rivers. Some of the current and likely challenges in stormwater management that may occur in the future such as increased risks to water quality, climate change impacts and the use of stormwater as a resource for human and environmental needs are discussed. Emerging and identified problems such as transport of key synthetic organic pollutants e.g. PFAS; antibiotic resistant bacteria and genes; transport of nutrients and social acceptance and current regulations relating to stormwater capture and reuse are also highlighted along with future impacts of growing urbanisation on flood risk.