



Multifunctional benefits of SuDS: techno-economic evaluation of decentralised solutions for urban water management

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The increased frequency of extreme weather events associated with climate change poses a significant threat to the integrity and function of critical urban infrastructure – rail, road, telecommunications, power and water supply/sewerage networks. A key threat within the United Kingdom (UK) is the increased risk of pluvial flooding; the conventional approach of channeling runoff to an outfall has proven to be unsustainable during severe storm events. Green infrastructure, in the form of Sustainable Urban Drainage Systems (SuDS), has been proposed as a means of minimising the risk of pluvial flooding. However, despite their technical performance, SuDS uptake in the UK has not reached its full capacity yet, mostly due to reasons that go beyond the engineering realm. This work investigated the strategic role of SuDS retrofit in managing environmental risks to urban infrastructure in London at a catchment level, through an economic appraisal of multifunctional benefits. It was found that by including the multifunctional benefits of SuDS, the economic feasibility of the project improves considerably. The case study has also shown a mechanism towards achieving wider-scale SuDS retrofit, whereby the investments are split amongst multiple stakeholder groups by highlighting the additional benefits each group derives. Groups include water utilities and their users, local government and critical infrastructure owners. Finally, limitations to the existing cost-benefit methodology in the UK were identified, and recommendations made regarding incentives and governmental regulations to enhance the uptake of SuDS in London. The proposed methodology provides compelling and robust, cost-benefit based evidence of SuDS' effectiveness within the flood risk management planning framework, but also with regard to the additional benefits of Nature Based Solutions in urban environments.