

## Evaluation of urban pollutant washoff characteristics and treatment efficiency of a small constructed wetland

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### Abstract

Nature-based solutions (NBS) offer a wide variety of techniques that promote cost-efficient stormwater management practices. In particular, low impact development facilities utilize NBS principles to restore the ecosystem services in a highly-urbanized area. Despite the advancements in these technologies, several considerations should still be addressed to ensure optimum functionality and attainment of desired pollutant removal efficiency a LID facility. This study evaluated the mass flushing characteristics of pollutants in an urban catchment and the efficiency of a small constructed wetland (SCW) in treating urban stormwater runoff. 21 rainfall events from 2010 to 2018 were monitored to determine and quantify stormwater pollutants. The highest pollutant washoff was observed on rainfall depths ranging from 0.1mm to 10mm, whereas events with greater rainfall depths exhibited lower pollutant concentrations due to dilution effect. However, the SCW manifested lower pollutant-removal performance on rainfall depths exceeding 10mm due to the exceedance of the facility's design rainfall. This study is beneficial in assessing the dynamics of pollutant washoff and efficiency of LID facilities subjected under various external factors.

**Keywords : Constructed wetland, Low impact development, Nature-based solutions, Stormwater**

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