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Pollutant characteristics on roof surfaces for evaluation as a stormwater harvesting catchment

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ABSTRACT

This paper presents the outcomes of a study which focused on evaluating roof surfaces as stormwater harvesting catchments. Build-up and wash-off samples were collected from model roof surfaces. The collected build-up samples were separated into five different particle size ranges prior to the analysis of physico-chemical parameters. Study outcomes showed that roof surfaces are efficient catchment surfaces for the deposition of fine particles which travel over long distances. Roof surfaces contribute relatively high pollutant loads to the runoff and hence significantly influence the quality of the harvested rainwater. Pollutants associated with solids build-up on roof surfaces can vary with time, even with minimal changes to total solids load and particle size distribution. It is postulated that this variability is due to changes in distant atmospheric pollutant sources and wind patterns. The study highlighted the requirement for first flush devices to divert the highly polluted initial portion of roof runoff. Furthermore, it is highly recommended to not to harvest runoff from small intensity rainfall events since there is a high possibility that the runoff would contain a significant amount of pollutants even after the initial runoff fraction.

Keywords: Rainwater harvesting; Roof runoff; Stormwater pollution

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