

Performance of artificial wetland in removing contaminants from storm water under tropical climate

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Abstract Rapid growth has resulted in increased storm water flow into receiving waters, with increases in flooding through drainage of storm water runoff from urban areas to receiving water bodies. The design philosophy of the conventional storm water drainage system was based on solving localized floods, either by transferring excessive flow in drainage systems downstream by upgrading the drainage system, or relieving localized problems by constructing storm overflows. In response to these issues there are needs for a paradigm shift in the way storm water is managed. There are various Best Management Practices (BMPs) techniques which can be used to control storm water runoff to achieve the target for water quality index similar to that before the development started. The artificial wetland system is part of the sustainable urban drainage system and this system has a main function in water quality improvement. The objective of this study was to determine the removal efficiency of contaminants in urban storm water by a wetland constructed in the Universiti Sains Malaysia (USM) Penang catchment. The result showed that the average removal efficiency of BOD was 9.7–80%, DO was 6.5–17.8%, turbidity was 25.9–30.0% and TP was 24–46%. In addition, strong positive correlations were found between water quality parameters at the inlet and water quality parameters at the outlet. However, a weak positive correlation between DO concentration at the inlet with BOD concentration at the inlet was identified throughout this study.

Key words artificial wetland; water quality; removal efficiency; storm water; urban drainage