



Reconstruction of existing conventional storm drainage systems in developing countries with inclusion of Best Management Practice elements: A case study

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ABSTRACT

In the majority of developing countries, stormwater drainage practice consists of a conventional storm drainage system design which either assumes combined sewer system, or in the best case, separate wastewater and storm drainage systems without any attenuation or peak flow decreasing effects. Rather, stormwater drainage practice is to evacuate excess water from the area as soon as possible. This paper aims to show the overall effects of reconstruction of existing conventional stormwater drainage system into new ones by the inclusion of BMP elements such as swales and detention ponds. Part of the existing system is replaced with BMP elements (e.g. swales) and new ones are added (detention ponds, where appropriate for design). Effects are analyzed through comparison of results from a mathematical model for existing and reconstructed stormwater drainage system, for both water quality and quantity at the sub-basin outlet point. Cost effectiveness of the applied measures is quantified by comparing construction prices for existing and reconstructed system. Reconstruction of the existing stormwater drainage system is proposed respecting recognized and anticipated problems with local communities/municipalities in developing countries. The resulting water quality and quantity values clearly show an urgent need for improving stormwater drainage practice in countries where the conventional approach is still in use.

KEYWORDS

Best management practice, modelling, pollution, runoff, stormwater drainage system