



The Economics of Stormwater BMPs in Tehran, Iran

Sakineh Tavakoli¹, Masoud Tajrishy²

¹ Sharif University of Technology, Tehran, Iran, sakineh.tavakoli@gmail.com

² Sharif University of Technology, Tehran, Iran, tajrishy@sharif.edu

ABSTRACT

Stormwater runoff has a lot of negative quantitative and qualitative effects on the surrounding environment. Best Management Practices (BMPs) are innovative technologies that can control these effects within natural and economic limitations.

Three types of BMPs are discussed in this study; swale, bioretention systems and pond. They have different installation costs and pollutant removal efficiency. The main objective of this paper is to find out the minimum cost combinations of these three BMPs, to reduce the concentration of total suspended solids, total phosphorous and total nitrogen in order to achieve water quality standards for urban streams.

Two models are used for this purpose: watershed and economic Models. Watershed model (MUSIC) provides stormwater and pollutant simulations and calculates BMP's pollutant removal rates. The outputs of watershed model serve as inputs to economic model (GAMS) which provides minimum cost optimization procedure. Another input for economic model is BMP's life cycle cost. Structural stormwater BMPs demand initial capital investments for design and construction and annual operating and maintenance costs.

Results show that swales are the least expensive BMPs to construct and maintain. These results can be used for decision making and help to find a balance between environmental protection and urban development.

KEYWORDS

BMP, GAMS, life cycle costs, MUSIC, Stormwater runoff, Tehran