



Keeping Sediment and Nutrients out of Streams in Arid/Semi-Arid Regions: Application of Low Impact Development/Green Infrastructure Practices

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Abstract: Climatic and hydrological characteristics in the arid/semi-arid areas create unique challenges to soil, water and biodiversity conservation. These areas are environmentally sensitive, but very valuable for the ecosystems services they provide to society. Some of these areas are experiencing the fastest urbanization and now face multiple water resource challenges. Low Impact Development (LID)/Green Infrastructure (GI) practices are increasingly popular for reducing stormwater and nonpoint source pollution in many regions around the world. However, streamflow in the arid/semi-arid regions is largely dependent on seasonal, short term, and high intensity rainfall events. LID has not been very common in the arid/semi-arid regions due to a lack of performance evaluation, as well as the perception that LID may not be very useful for regions with little annual precipitation. This study focused on investigating the hydrologic and pollutant removal performance of LID/GI systems in arid/semi-arid climates. Ten types of practices were found in use in the Western/Southwestern U.S.: rainwater harvest systems, detention ponds, retention ponds, bioretention, media filters, porous pavements, vegetated swales/buffer/strips, green roofs, infiltration trenches, and integrated LIDs. This study compared the performance of these practices in terms of their effectiveness at pollutant removal and cost-effectiveness. This analysis provides insight into the future implementation of LID/GI in the arid/semi-arid areas.

Key words: LID/GI, arid/semi-arid, effectiveness of pollutant removal, cost-effectiveness analysis