

Review of the influence of low-impact development practices on mitigation of flood and pollutants in urban areas

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ABSTRACT

Urbanization has a significant impact on the hydrological characteristics of developed areas as well as downstream regions. As a watershed is increasingly covered with impervious surfaces, it experiences decreased rainwater infiltration, increased runoff, and shortened concentration times, thereby affecting the natural cycle of urban water systems. Many natural flood control and storage mechanisms have been systematically destroyed by urban development, and water pollution has become an increasingly serious global concern. Low-impact development (LID) is an ecological rainwater runoff management method that has been identified as a promising approach to reduce runoff and improve water quality. Recent research and advances in LID are systematically introduced and reviewed in this paper, including popular models, the main LID design elements and facilities, and the mitigation that LID provides for both floods and pollutants in urban areas. Future research into LID will need to enlarge its scope to broader regions and networks, develop and refine suitable models, and explore ways to integrate LID into existing water management systems in urban areas.

Keywords: Low-impact development; Flood mitigation; Storm water management model; Urban area; Roadway runoff; Water quality purification

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