

Integration and Evaluation of Green Stormwater Capture Measures in Reducing Urban Floods

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Abstract

Haphazard rapid urbanisation and climate change continue to escalate and degrade water environments with increasing stormwater runoff, water bodies pollution and depleting groundwater table. The increase in stormwater, marked by greater runoff volume and accelerated peak discharge, has led to frequent urban floods. To address these challenges, green stormwater capture measures such as rain-gardens, infiltration trenches, porous pavement and temporary water storage with landscaping can help to mitigate urban floods, curb environmental degradation, and enhance the aesthetic and recreational appeal of water environments. Utilising numerical hydrological models such as HEC-HMS proves invaluable in predicting runoff volumes, peak flows, and flow timing by simulating watershed behaviours. In this context, HEC-HMS was applied to simulate peak discharge, a crucial indicator of flooding, enabling an understanding and evaluation of the impact of green stormwater capture measures. An investigation was conducted on the Yato Watershed in Tokyo for proposing sustainable stormwater management amid rapid urbanisation and climate change. By doing so, the reliance on costly urban land or the utilisation of scarce publicly-owned land for centralised facilities can be significantly reduced.

Keywords: *green stormwater capture measures, HEC-HMS modeling, sustainable stormwater management, urban floods, yato watershed*