

Peran green infrastructure dalam pengurangan limpasan hujan di kawasan perkotaan : studi kasus daerah tangkapan air pondok kelapa, jakarta timur = The role of green infrastructure in reducing runoff in urbanized areas : case study pondok kelapa catchment, eastern jakarta

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Abstrak

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Urbanisasi telah mengubah tutupan lahan dari permukaan lolos air menjadi permukaan kedap air yang dapat berdampak pada peningkatan limpasan hujan di kawasan perkotaan. Penelitian ini bertujuan untuk menilai efektifitas sebaran spasial Green Infrastructure (GI) dalam pengurangan limpasan hujan di berbagai spektrum hujan. Simulasi pengurangan limpasan hujan melalui penerapan GI diimplementasikan pada DTA yang berlokasi di Pondok Kelapa, Duren Sawit, Jakarta Timur. EPA SWMM digunakan untuk mensimulasi model hidrologi melalui tiga skenario : skenario-1 baseline (kondisi eksisting tanpa penerapan GI), skenario-2 GI (penerapan GI melalui rain garden, rain barrel dan porous pavement), skenario-3 RDTR (sesuai Rencana Detail Tata Ruang DKI Jakarta). Hasil simulasi SWMM menunjukkan skenario-2 GI untuk hujan kala ulang 2-, 5-, 10-, 25-, 50-tahun menghasilkan persentase pengurangan total volume limpasan secara berurutan sebesar 9.76%, 8.76%, 8.27%, 7.50%, 7.05% dan persentase pengurangan debit puncak sebesar 9.29%, 7.97%, 5.83%, 3.49%, 2.21% dibandingkan tanpa penerapan GI. Adapun untuk skenario-3 RDTR untuk kala ulang hujan yang sama menghasilkan persentase penambahan total volume limpasan secara berurutan sebesar 7.43%, 6.15%, 5.36%, 4.67%, 4.20% dan persentase penambahan debit puncak sebesar 3.93%, 2.33%, 1.29%, 0.63%, 0.63% dibandingkan dengan kondisi eksisting tanpa penerapan GI.

**ABSTRACT**

Urbanization has changed the land use from pervious cover to impervious cover which have an impact on increasing runoff in urban areas. The objective of this study is to determine the effectiveness of spatial distribution of Green Infrastructure (GI) in reducing runoff under various design storms. Simulation of runoff reduction is carried out by implementing the GI in the catchment area located in Pondok Kelapa, Eastern Jakarta, Indonesia. EPA SWMM 5.1 was used to simulate the performance of GI on reducing runoff in the study site for three simulation scenarios: baseline scenario (current conditions), GI scenario (implementing rain garden and rain barrel) and Rencana Detail Tata Ruang (RDTR) scenario. The results show that GI scenario compared to the baseline scenario under various design storms 2-year, 5-year, 10-year, 25-year and 50-year return periods reduce the total runoff volume approximately 9.76%, 8.76%, 8.27%, 7.50%, 7.05, respectively and reduce the peak flows approximately 9.29%, 7.97%, 5.83%, 3.49%, 2.21%. For RDTR scenario compared to BL scenario

resulting in percentile of total runoff volumes increase were 7.43%, 6.15%, 5.36%, 4.67%, 4.20% and the percentile of peak flows increase were 3.93%, 2.33%, 1.29%, 0.63%, 0.63% for the same return periods.

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