

INTISARI

Daerah perkotaan mengalami peningkatan jumlah penduduk yang pesat akibat dari urbanisasi yang tinggi. Urbanisasi dapat menyebabkan masalah lingkungan, seperti berkurangnya daya serap daerah tangkapan air terhadap curah hujan yang berujung pada penurunan infiltrasi dan peningkatan aliran permukaan. Jumlah air yang meresap ke dalam tanah atau laju infiltrasi, dipengaruhi oleh berbagai faktor, termasuk jenis tanah, tata guna lahan, kepadatan tanah, kandungan air, derajat saturasi, porositas, rasio pori, densitas total, vegetasi penutup, kemiringan lahan, dan kondisi geologi. Penelitian ini menganalisis faktor-faktor yang memengaruhi laju infiltrasi, yaitu kondisi geologi, tata guna lahan, serta karakteristik tanah, seperti kepadatan tanah dan jenis tanah. Pengukuran laju infiltrasi dan pengambilan sampel tanah dilakukan di Kelurahan Krobokan yang memiliki luas 1,19 km² dengan 23 stasiun titik amat. Data primer yang dikumpulkan meliputi nilai laju infiltrasi yang diukur dengan Turf-tec infiltrometer, sampel tanah yang dianalisis di laboratorium untuk mendapatkan data jenis tanah dan kepadatan tanah, data geologi dari pemetaan geologi yang dibandingkan dengan data sekunder dari instansi setempat, dan data tata guna lahan yang diverifikasi di lapangan. Laju infiltrasi dihitung menggunakan persamaan perkiraan dari Kostiakov dan hasilnya diklasifikasikan menurut Kohnke (1968). Analisis spasial dilakukan pada data litologi, tata guna lahan, dan karakteristik tanah. Analisis grafik dilakukan pada data karakteristik tanah setelah diuji normalitasnya dengan metode *Shapiro-Wilk*. Hasil analisis spasial menunjukkan bahwa sebaran laju infiltrasi di Kelurahan Krobokan dipengaruhi oleh kondisi geologi, tata guna lahan, dan karakteristik tanah. Hasil analisis grafik menunjukkan bahwa kepadatan tanah memengaruhi laju infiltrasi sebesar 19,6%, sedangkan fraksi tanah memiliki pengaruh terbesar sebesar 24,42%. Laju infiltrasi tertinggi sebesar 258,396 mm/jam ditemukan di bagian tengah daerah penelitian, sedangkan laju infiltrasi terendah sebesar 10,556 mm/jam ditemukan di bagian barat laut daerah penelitian.

Kata kunci: daerah perkotaan, laju infiltrasi, litologi, tata guna lahan, karakteristik tanah



ABSTRACT

Urban areas are experiencing a rapid increase in population due to high urbanization. Urbanization can cause environmental problems, such as reduced catchment absorption of rainfall leading to decreased infiltration and increased surface runoff. The amount of water that infiltrates into the soil or infiltration rate, is influenced by various factors, including soil type, land use, soil density, water content, degree of saturation, porosity, pore ratio, total density, vegetation cover, slope, and geology. This research analyzes the factors that affect infiltration rates, namely geological conditions, land use, and soil characteristics such as soil density and soil type. Infiltration rate measurements and soil sampling were conducted in Krobokan Urban Village, which has an area of 1.19 km² with 23 point stations. Primary data collected included infiltration rate values measured with a Turf-tec infiltrometer, soil samples analyzed in the laboratory to obtain data on soil type and soil density, geological data from geological mapping compared with secondary data from local agencies, and land use data verified in the field. Infiltration rates were calculated using Kostiaikov's approximate equation and the results were classified according to Kohnke (1968). Spatial analysis was conducted on lithology, land use and soil characteristics data. Graphical analysis was conducted on the soil characteristics data after testing for normality using the Shapiro-Wilk method. The results of the spatial analysis show that the distribution of infiltration rates in Krobokan Village is influenced by geological conditions, land use, and soil characteristics. The results of graphical analysis show that soil density affects the infiltration rate by 19.6%, while soil fraction has the greatest influence of 24.42%. The highest infiltration rate of 258.396 mm/h was found in the central part of the study area, while the lowest infiltration rate of 10.556 mm/h was found in the northwest part of the study area.

Keywords: urban area, infiltration rate, lithology, land use, soil characteristics

