

SARI

Dalam siklus hidrologi, proses masuknya air ke dalam tanah disebut dengan proses infiltrasi. Proses ini sangatlah penting dalam mengubah air hujan menjadi aliran sungai serta dalam penentuan tata guna lahan. Dalam penelitian ini, metode yang digunakan untuk mengukur laju infiltrasi adalah model infiltrasi Philips dan Kostiakov yang dinilai lebih efektif dibanding model lainnya. Ada banyak faktor yang dapat mempengaruhi hasil pengukuran laju infiltrasi, di antaranya seperti parameter fisik tanah, yaitu kandungan air, porositas, rasio pori, dan derajat saturasi. Pengujian dilakukan pada 32 titik pengukuran di Desa Ngalang dan Sekitarnya, Kecamatan Gedangsari, Kabupaten Gunungkidul. Titik pengukuran laju infiltrasi diambil berdasarkan pembagian litologi dan jenis tanah di daerah penelitian. Data primer didapatkan dari pemetaan geologi, pengukuran laju infiltrasi di lapangan menggunakan *turf-terc* infiltrometer, pengambilan sampel tanah, dan pengukuran parameter fisik tanah di laboratorium. Data pengukuran laju infiltrasi di lapangan dihitung menggunakan model infiltrasi Philips dan Kostiakov yang selanjutnya diklasifikasikan dengan klasifikasi Kohnke (1968) serta digunakan dalam menentukan penggunaan lahan di daerah penelitian. Data litologi, jenis tanah, dan sifat fisik tanah dikorelasikan secara *overlay* dan grafik terhadap laju infiltrasi model Philips yang dinilai lebih baik dibanding model Kostiakov. Hasil korelasi *overlay* menunjukkan laju infiltrasi dipengaruhi oleh litologi, jenis tanah, dan sifat fisik tanah, sedangkan hasil korelasi grafik menunjukkan litologi, jenis tanah, kandungan air, porositas, rasio pori, dan derajat saturasi tanah memiliki hubungan terhadap laju infiltrasi. Parameter jenis tanah memiliki hubungan terkecil terhadap laju infiltrasi dengan nilai R^2 yaitu 0,0054, sedangkan rasio pori serta kandungan air memiliki hubungan terbesar terhadap laju infiltrasi dengan nilai R^2 yaitu 0,2603 dan 0,2531. Hasil pengukuran laju infiltrasi model Philips menunjukkan nilai laju infiltrasi yang beragam dari 0 mm/jam hingga 1386,67 mm/jam. Berdasarkan nilai laju infiltrasinya, tata guna lahan daerah penelitian dibagi menjadi empat, yaitu area pertanian dan penggembalaan, perkebunan, perladangan, dan *recharge area*.

Kata kunci: Kostiakov, laju infiltrasi, Philips, *recharge area*, *turf-terc* infiltrometer

ABSTRACT

In the hydrologic cycle, the process by which water enters the soil is called infiltration. This process is very important in converting rainwater into river flows and in determining land use. In this study, the method to measure the infiltration rate is Philips and Kostiakov infiltration model which is considered more effective compared to other models. There are many factors that affect the results of infiltration rate, including the physical parameters of soil, namely water content, porosity, pore ratio, and saturation degree. Tests were carried out at 32 points in Ngalang Village and surroundings, Gedangsari District, Gunungkidul Regency. Infiltration rate measurement points taken based on distribution of lithology and soil types. Primary data were obtained from geological mapping, measuring infiltration rates using turf-terc infiltrometer, soil sampling, and measuring soil physical parameters in laboratory. Infiltration rate were calculated using Philips and Kostiakov infiltration model which were classified by Kohnke's classification (1968) and used in determining land use in the study area. Lithology, soil type, and soil physical properties are correlated by overlay and graph to infiltration rate of Philips model which is considered better than Kostiakov model. The overlay correlation show that infiltration rate is influenced by lithology, soil type, and soil physical properties, while the graphical correlation show that the soil type, water content, porosity, pore ratio, and soil saturation degree have relation to infiltration rate. Soil type has the smallest influenced with R^2 value of 0.0054, while the pore ratio and water content is the biggest with R^2 value of 0.2603 and 0.2531. The results of infiltration rate measurements showed various infiltration rate values from 0 mm/hour to 1386.67 mm/hour. Based on the infiltration rate, the land use of the study area is divided into four, which is agricultural and pasture land, plantation land, field land, and recharge areas.

Keyword: Kostiakov, infiltration rate, Philips, recharge area, turf-terc infiltrometer,