PENGUKURAN ALIRAN PERMUKAAN DAN SEDIMEN SUSPENSI SERTA HUBUNGANNYA DENGAN KARAKTERISTIK HUJAN PADA LAHAN AGROFORESTRI DI DAERAH TANGKAPAN AIR TAMANSARI

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INTISARI

Daerah Tangkapan Air (DTA) Tamansari merupakan bagian dari Sub-DAS Merawu yang terletak di DAS Serayu bagian hulu yang merupakan salah satu DAS Kritis di Pulau Jawa. Penggunaan lahan di DTA Tamansari didominasi agroforestri yakni memadukan komponen kehutanan dengan pertanian. Tujuan dari penelitian ini adalah untuk mengidentifikasi tebal aliran permukaan dan sedimen suspensi serta mengetahui hubungan keduanya dengan karakteristik hujan yakni tebal hujan, durasi hujan, intensitas hujan, dan intensitas hujan maksimal dalam 30 menit di DTA Tamansari.

Penelitian ini dilakukan dari tanggal 1 Oktober 2023 – 31 April 2024 (212 hari). Data tinggi muka air diambil menggunakan alat *automatic water level recorder* yang diolah untuk menghasilkan debit aliran. Data karakteristik hujan diambil menggunakan alat *automatic rainfall recorder*. Sedimen suspensi diambil menggunakan seperangkat alat yang terpasang di SPAS yang terdiri dari rak *suspended sampler*, botol 600 ml, selang, dan jaringan strimin. Data tebal aliran permukaan dan sedimen suspensi dianalisis hubungannya dengan karakteristik hujan menggunakan analisis korelasi dan dimodelkan dengan analisis regresi sederhana.

Terdapat 34 kejadian hujan terpilih yang diperoleh selama penelitian. Tebal aliran permukaan yang teridentifikasi memiliki rata-rata 0,3 mm. Koefisien aliran (C%) yang dihasilkan memiliki rata-rata 2,02%. Intensitas hujan maksimal dalam 30 menit (I30) memiliki hubungan paling kuat terhadap tebal aliran permukaan dengan nilai koefisien korelasi 0,882. Selain itu, Intensitas hujan maksimal dalam 30 menit (I30) juga memiliki hubungan paling kuat terhadap sedimen suspensi dengan nilai koefisien korelasi 0,619. Massa sedimen suspensi total yang teridentifikasi selama waktu penelitian sebesar 53,45 ton/ha.

Kata Kunci: *DTA Tamansari, agroforestri, tebal aliran permukaan*, *sedimen suspensi*

MEASUREMENT OF DIRECT RUNOFF AND SUSPENDED SEDIMENT AND ITS RELATIONSHIP WITH RAINFALL CHARACTERISTICS ON AGROFORESTRY LAND IN TAMANSARI CATCHMENT AREA

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ABSTRACT

Tamansari catchment area is part of the Merawu sub-watershed located in the upper Serayu watershed, which is one of the most critical watersheds in Java. Land use in Tamansari catchment is dominated by agroforestry, which combines forestry components with agriculture. The purpose of this study was to identify the thickness of direct run off and suspended sediment and determine the relationship between the two with rain characteristics, namely rain thickness, rain duration, rain intensity, and maximum rain intensity in 30 minutes in Tamansari watershed.

This research was conducted from October 1, 2023 - April 31, 2024 (212 days). Water level data was taken using an automatic water level recorder which was processed to produce flow discharge. Data on rainfall characteristics were taken using an automatic rainfall recorder. Suspended sediment was collected using a set of tools installed at SPAS consisting of a suspended sampler rack, 600 ml bottle, hose, and strimin network. Data on direct run off thickness and suspended sediment were analyzed for their relationship with rainfall characteristics using correlation analysis and modeled with simple regression analysis.

There were 34 selected rainfall events obtained during the study. The identified direct run off thickness had an average of 0.3 mm. The resulting flow coefficient (C%) had an average of 2.02%. The maximum rainfall intensity in 30 minutes (I30) has the strongest relationship to the thickness of direct run off with a correlation coefficient value of 0.882. In addition, the maximum rainfall intensity in 30 minutes (I30) also has the strongest relationship to suspended sediment with a correlation coefficient value of 0.619. The total suspended sediment mass identified during the study time was 53.45 tons/ha.

Keywords: *Tamansari catchmen area*, *agroforestry, thickness of direct run off, suspended sediment*

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