

**HUBUNGAN ANTARA KARAKTERISTIK HUJAN  
DENGAN DEBIT SUSPENSI RATA-RATA HARIAN  
DAN DEBIT SUSPENSI PUNCAK HARIAN  
SUB DAS WATUJALI DAN SUB DAS SILENGKONG**

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**INTISARI**

Hutan memiliki fungsi perlindungan terhadap erosi dan sedimentasi. Adanya perubahan fungsi hutan pinus di sub DAS Watujali dan sub DAS Silengkong diduga mempengaruhi debit suspensi yang keluar dari sistem DAS tersebut. Penelitian ini bertujuan untuk mengetahui hubungan antara debit suspensi dengan debit aliran di SPAS Watujali dan Silengkong, serta mengetahui hubungan antara karakteristik hujan dengan debit suspensi rata-rata harian dan debit suspensi puncak harian di kawasan hutan pinus sub DAS Watujali dan sub DAS Silengkong.

Pada penelitian ini dilakukan pengukuran pada tinggi muka air (m) menggunakan alat *automatic water level recorder*, debit aliran (liter/dtk) menggunakan alat *current meter*, debit suspensi (gram/dtk) menggunakan alat *suspended sampler*, tebal hujan harian (mm), lama hujan harian (jam), dan intensitas hujan maksimum 30 menit (mm/jam) menggunakan *automatic rain recorder*. Metode analisis yang digunakan yaitu metode analisis regresi ganda menggunakan bantuan *software SPSS 15.0 for Windows* dengan menempatkan debit suspensi rata-rata harian ( $Y_1$ ) dan debit suspensi puncak harian ( $Y_2$ ) sebagai variabel bergantung dan tebal hujan ( $X_1$ ), lama hujan ( $X_2$ ) dan I maks 30 ( $X_3$ ) sebagai variabel bebas.

Dari Penelitian ini diperoleh persamaan kurva hubungan antara debit suspensi ( $Q_s$ ) dengan debit aliran ( $Q$ ) di SPAS Watujali yaitu :  $Q_s = 0,00076 Q^{1,822}$ , dan di sub DAS Watujali, ditarik kesimpulan bahwa ketiga karakteristik hujan berpengaruh nyata terhadap debit suspensi rata-rata harian dan debit suspensi puncak harian. Model yang diperoleh untuk penaksiran debit suspensi rata-rata harian :  $Y_1 = -0,120 - 0,6 (X_1) + 1,806 (X_2) + 0,774 (X_3)$  dan debit suspensi puncak harian :  $Y_2 = -1,078 + 3,889 (X_1) - 7,198 (X_2) - 0,747 (X_3)$ . Sedangkan di SPAS Silengkong, diperoleh persamaan kurva yaitu :  $Q_s = 0,0011 Q^{1,771}$ , dan di sub DAS Silengkong hanya tebal hujan dan intensitas hujan maksimum 30 menit yang berpengaruh nyata terhadap debit suspensi rata-rata harian dan debit suspensi puncak harian. Model yang diperoleh untuk penaksiran debit suspensi rata-rata harian :  $Y_1 = 4,271 - 0,335 (X_1) + 0,445 (X_3)$  dan debit suspensi puncak harian :  $Y_2 = 33,485 - 3,296 (X_1) + 4,262 (X_3)$ .

Kata Kunci : DAS, hutan pinus, kurva lengkung suspensi, karakteristik hujan, debit suspensi

**RELATIONSHIP BETWEEN RAINFALL CHARACTERISTICS  
WITH DAILY AVERAGE SUSPENSION DISCHARGE  
AND DAILY PEAK SUSPENSION DISCHARGE  
SUB WATERSHED WATUJALI AND SUB WATERSHED SILENGKONG**

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**ABSTRACT**

Forests help protect against erosion and sedimentation. The change of pine forest function in the sub watershed Watujali and sub watershed Silengkong was predicted to influence the suspension discharge out of the watershed system. This research aimed to find out the relationship between suspension discharge with flow discharge in both river flow observation station, and determine the relationship between rainfall characteristics with daily average suspension discharge and daily peak suspension discharge in pine forest sub watershed Watujali and sub watershed Silengkong.

In this research, the measurement of water level (m), was carried out using automatic water level recorders, flow rates (lt/sec) using current meter, suspension discharge (gr/sec) using suspended sampler, daily rainfall depth (mm), daily rainfall duration (hours), and maximum rainfall intensity in 30 minutes (mm / hours) using automatic rain recorder. The analysis method used was the multiple regression using the help of SPSS 15.0 for Windows software by placing the daily average suspension discharge ( $Y_1$ ) and daily peak suspension discharge ( $Y_2$ ) as the dependent variable and the rainfall depth ( $X_1$ ), rainfall duration ( $X_2$ ), and maximum rainfall intensity in 30 minutes ( $X_3$ ) as independent variables.

From this research it was found that the equation of relationship between suspension discharge ( $Q_s$ ) with flow discharge ( $Q$ ) in the river flow observation station Watujali was :  $Q_s = 0,00076 Q^{1,822}$ , and in sub watershed Watujali, all of rainfall characteristics significantly affected the daily average suspension discharge and daily peak suspension discharge. The model obtained to estimate daily average suspension discharge :  $Y_1 = - 0,120 - 0,6 (X_1) + 1,806 (X_2) + 0,774 (X_3)$  and daily peak suspension discharge :  $Y_2 = - 1,078 + 3,889 (X_1) - 7,198 (X_2) - 0,747 (X_3)$ . While in the river flow observation station Silengkong, the equation of relationship between suspension discharge with flow discharge was :  $Q_s = 0,0011 Q^{1,771}$ , and in sub Watershed Silengkong only daily rainfall depth and maximum rainfall intensity in 30-minutes significantly affected the daily average suspension discharge and daily peak suspension discharge. The model obtained to estimate daily average suspension discharge :  $Y_1 = 4,271 - 0,335 (X_1) + 0,445 (X_3)$  and daily peak suspension discharge :  $Y_2 = 33,485 - 3,296 (X_1) + 4,262 (X_3)$ .

**Keywords :** watershed, pine forest, suspended discharge rating curve, rainfall characteristics, suspension discharge