

## HUBUNGAN KARAKTERISTIK HUJAN DENGAN VOLUME *DIRECT RUNOFF* (DRO) DI HUTAN PINUS DAN HUTAN PINUS CAMPURAN

Urfi Izzati<sup>1)</sup>

### INTISARI

Hutan merupakan salah satu komponen DAS yang berfungsi sebagai prosesor pengalihragaman hujan menjadi DRO. Perbedaan penutupan vegetasi hutan antara hutan pinus DTA Rahtawu dan hutan pinus campuran DTA Gajah Mungkur akan mempengaruhi DRO yang dihasilkan dengan masukan hujan yang sama. DRO merupakan komponen aliran yang potensial menyebabkan banjir oleh suatu hujan efektif. Karakteristik hujan penting untuk diperhatikan karena setiap kejadian hujan akan menghasilkan keluaran yang berbeda-beda. Kedua DTA terletak di bagian hulu yang berfungsi sebagai kawasan hutan produksi dan daerah tangkapan air sehingga penting untuk dikaji. Penelitian ini bertujuan untuk mengetahui perbedaan volume DRO yang terjadi serta mengetahui hubungan antara karakteristik hujan dengan volume DRO di hutan pinus dan hutan pinus campuran.

Penelitian dilakukan dengan cara menganalisis grafik dari *Automatic Rainfall Recorder* (ARR) dan memisahkan volume DRO dengan volume *baseflow* menggunakan *Straight Line Method*. Uji t dilakukan dengan *Independent t Test* untuk mengetahui perbedaan rata-rata volume DRO pada dua lokasi. Selain itu dilakukan analisis statistik model korelasi dan regresi linear berganda untuk mengetahui keeratan dan bentuk hubungan antara volume DRO sebagai variabel bergantung dengan karakteristik hujan berupa tebal hujan (P), lama hujan (Dr), dan intensitas hujan (I) sebagai variabel bebas.

Hasil penelitian menunjukkan bahwa rata-rata volume DRO yang terjadi di hutan pinus 84,4666 m<sup>3</sup>/ha dan hutan pinus campuran 12,9589 m<sup>3</sup>/ha. Berdasarkan hasil uji t menunjukkan bahwa rata-rata volume DRO hutan pinus dengan rata-rata volume DRO hutan pinus campuran tidak berbeda nyata dan berdasarkan hasil analisis regresi linier berganda variabel yang berpengaruh nyata terhadap volume DRO hutan pinus adalah intensitas hujan (I), sedangkan variabel yang berpengaruh nyata terhadap volume DRO hutan pinus campuran adalah tebal hujan (P). Volume DRO (m<sup>3</sup>/ha) di hutan pinus dapat ditaksir dengan persamaan  $DRO\_Pinus = -73,477 + 8,309 (I)$  dan di hutan pinus campuran dapat ditaksir dengan persamaan  $DRO\_Campuran = -19,322 + 0,676 (P)$ .

Kata kunci : *direct runoff*, karakteristik hujan, hutan pinus

<sup>1)</sup> Mahasiswa Jurusan Konservasi Sumber Daya Hutan, Fakultas Kehutanan Universitas Gadjah Mada

## THE RELATIONSHIPS BETWEEN RAINFALL'S CHARACTERISTICS AND DIRECT RUNOFF VOLUME IN PINE FOREST AND MIX PLANTING PINE FOREST

Urfi Izzati<sup>1)</sup>

### ABSTRACT

Forest is one of basin components which functions as processor in changing rainfall into direct runoff (DRO). The difference of land cover type between the pine forest in Rahtawu catchments area and the mix planting pine forest in Gajah Mungkur catchments area will affect the DRO produced by the same rainfall input. An effective rainfall, DRO is a discharge component that potentially causes flood. Rainfall's characteristics are important to concern because every rainfall will bring different outcome. Both of catchments areas are important to examine since they lay in upper area that function as production forest area and catchments area. The objectives of this research were to identify the difference of DRO volume that occurred and the relation between rainfall's characteristics and DRO volume in pine forest and mix planting pine forest.

The research was carried out both by analyzing automatic rain recorder (ARR) graph and separating DRO volume and base flow volume using Straight Line Method. The difference of DRO volume average was analyzed by Independent T-Test. In addition, the correlation analysis and multiple regressions were also performed. The function of these analyses was to identify the strength and direction respectively of the association between DRO volume as dependent variable and rainfall's characteristics including precipitation depth (P), duration (Dr), and precipitation intensity (I) as independent variables.

The results of the research showed that DRO volume averages were 84.4666 m<sup>3</sup>/ha in pine forest and 12.9589 m<sup>3</sup>/ha in mix planting pine forest. Based on t-test results, it showed that DRO volume averages of pine forest and mix planting pine forest were not significantly different. Besides, the results of multiple regressions analysis showed that precipitation intensity (I) was the variable which significantly affected DRO volume of pine forest, while precipitation depth (P) was the variable which significantly affected DRO volume of mix planting pine forest. The DRO volume in pine forest could be estimated by the DRO-pine equation =  $-73.477 + 8.309 (I)$ . Meanwhile, the DRO volume in mix planting pine forest could be estimated by the DRO-mix planting pine equation =  $-19.322 + 0.676 (P)$ .

Key words: direct runoff, rainfall's characteristics, pine forest

<sup>1)</sup>A Student of Forest Resource Conservation Department, Faculty of Forestry Gadjah Mada University