



INTISARI

Penelitian tentang analisis ketersediaan air untuk perencanaan pengelolaan DAS dilakukan di Sub DAS Ngunut, Kabupaten Karanganyar. Tujuan penelitian ini; (1) menyusun model ketersediaan air untuk mengetahui proses input-output, (2) mengetahui kondisi komponen ketersediaan air pada setiap penggunaan lahan, (3) menentukan alternatif perencanaan pengelolaan DAS.

Penelitian ini dilakukan dalam 4 tahap yaitu; (1) pengumpulan data primer dan data sekunder, (2) pengolahan data, (3) penyusunan program komputer tentang sistem pergerakan air, (4) evaluasi. Sebelum model ketersediaan air digunakan lebih dahulu diuji validitasnya dengan uji distribusi T-student dan uji Korelasi, sehingga debit hasil simulasi tidak berbeda dengan debit observasi. Selanjutnya model ketersediaan air digunakan untuk menentukan perencanaan pengelolaan DAS yaitu diterapkan pada berbagai pola penggunaan lahan. Penentuan alternatif penggunaan lahan yang terbaik menggunakan pedoman nilai rasio debit dan nilai produksi lahan.

Hasil utama penelitian ini adalah: (1) perangkat lunak (software) tentang model ketersediaan air. Pengujian model menunjukkan bahwa nilai T-hitung 0,3569 dan T-tabel 1,83, artinya tidak ada perbedaan nyata antara debit simulasi dengan debit observasi, selanjutnya model dapat digunakan. (2) Nilai komponen ketersediaan air; curah hujan, intersepsi, evapotranspirasi, infiltrasi, simpanan air, dan aliran permukaan pada masing-masing penggunaan lahan berbeda. Pada kebun campuran; ternyata nilai infiltrasi, simpanan air dan perkolasi besar, sedangkan nilai aliran permukaan kecil. Sawah; nilai evapotranspirasi paling besar, sedangkan nilai intersepsi, infiltrasi dan simpanan air kecil. Tegal; nilai intersepsi paling besar, dan pada pemukiman nilai aliran permukaan paling besar. (3) Alternatif 4,3,dan 14; perubahan penggunaan lahan dari sawah dan tegal ke bentuk kebun campuran merupakan alternatif terbaik dalam mengatur tata air di Sub DAS Ngunut, sedangkan nilai produksinya besar. Alternatif 10,2,11,13; perubahan dari kebun campuran dan tegal menjadi bentuk sawah merupakan alternatif yang dianjurkan, sedangkan alternatif 6,7,8,9,12; perubahan dari kebun campuran dan sawah ke bentuk tegal dan pemukiman merupakan alternatif yang tidak dianjurkan.



ABSTRACT

Research on analysis of water availability for watershed management planning was conducted in Ngunut Sub Watershed, Karanganyar, Central Java. The aim of this research is; (1) formulating a model for water availability in order to know the input-output process, (2) knowing the condition of water availability components for each land-use, (3) determining the alternative watershed management.

The research was conducted 4 phases; (1) the collection of primary and secondary data, (2) data processing, (3) preparation of the computer program concerning water movement system, (4) evaluation. Before the application of the water availability model, its validity was tested with statistical analysis that is; student t-distribution and correlation, such that the model results do not differ from the results of observation. Furthermore, the water availability model was used to determine watershed management planning that is, it was applied for various landuse changes. The determination of the best alternative landuse was done using the discharge ratio value criterion and the agricultural production.

There are 3 main outcomes of this reseach. The first one is in form of software, concerning the water availability model. The testing of the model showed that, the t-calculation was 0.3569 and t-table was 1.83, which implies that, there is no significant difference between simulation and observation hence the model could be used. The second outcome is the component values of water availability that is, rainfall, interception, evapotranspiration, infiltration, water storage, and surface runoff for each landuse which differed. For mixed plantation; infiltration, water storage, and percolation had high values but surface runoff has a low value. For the ricefield ; evapotranspiration has the highest value, with interception, infiltration, and water storage having low values. For the dry fields; interception had the highest value. For the settlement; surface runoff had the biggest value. The third outcome is that, alternatives 3,4, and 14 which concern the landuse changes from irrigated rice fields and dry fields to form of mixed plantations, constitute the best alternatives in the spatial organization of Ngunut Watershed, whose values are high. For alternatives 2,10, 11,13 which are changing from mixed plantation and dry fields to irrigated rice fields, constitute the desirable alternatives. While alternative 6,7,8,9,12 which are changing from mixed plantation and rice fields to dry fields and settlement constitute alternatives which are undesirable.