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INTISARI

Penelitian ini bertujuan untuk melakukan identifikasi kontinuitas aliran sungai dengan cara menentukan parameter fisik lahan dari hasil interpretasi citra penginderaan jauh, serta mempertimbangkan imbangan air dalam DAS sepanjang tahun. Lokasi penelitian berada di DAS Garang Semarang, Jawa Tengah.

Citra yang digunakan ada dua macam yaitu citra Landsat ETM + dengan tanggal perekaman 1 Mei 2002 dan citra Aster perekaman 17 September 2006 untuk melakukan estimasi koefisien aliran menggunakan metode Cook pada musim hujan dan kemarau. Data pendukung lain yang digunakan untuk menghitung volume input dan output air di DAS Garang antara lain data meteorologi, data jumlah penduduk, jumlah hotel, dan jumlah industri, data debit dan lokasi mata air, dan data penggunaan air tanah oleh industri.

Metode yang digunakan adalah interpretasi citra Landsat dan Aster untuk mendapatkan informasi parameter fisik lahan, seperti kerapatan vegetasi, timbunan air permukaan, dan laju infiltrasi, sedangkan informasi kemiringan lereng diperoleh melalui pengolahan citra SRTM. Nilai koefisien aliran diperoleh melalui hasil overlay parameter fisik lahan tersebut. Data curah hujan digunakan untuk memperoleh volume input sepanjang tahun, sedangkan volume outputnya diperoleh dari volume kebutuhan air oleh penduduk dan data debit mata air. Volume input yang dikurangkan dengan volume output menghasilkan neraca air sepanjang tahun, yang kemudian digunakan untuk menentukan kontinuitas aliran sungai.

Hasil penelitian menunjukkan bahwa citra Landsat dan Aster cukup baik untuk interpretasi bentuklahan dengan ketelitian 80,76%, penutup lahan 84,61%, dan infiltrasi tanah 83,33%, sedangkan interpretasi kemiringan lereng menggunakan SRTM menghasilkan ketelitian sebesar 83,33%. Selain itu estimasi koefisien aliran dengan metode Cook memiliki ketelitian lebih dari 90%. Neraca air di DAS Garang bernilai surplus pada musim hujan namun mengalami defisit di musim kemarau pada ketiga sub dasnya. Sungai utama pada tiap sub DAS mengalir sepanjang tahun dari mata air dan rembesan, sedangkan sungai – sungai di bagian hulu yang tidak memiliki aliran dasar bertipe efemeral.

Kata kunci : Koefisien aliran, neraca air, aliran dasar



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Identifikasi kontinuitas aliran sungai menggunakan citra aster dan landsat ETM+ di DAS Garang Semarang

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Universitas Gadjah Mada, 2008 | Diunduh dari <http://etd.repository.ugm.ac.id/>

STREAM CONTINUITIES IDENTIFICATION USING ASTER AND LANDSAT ETM + IMAGE SATELLITES IN GARANG WATERSHED, SEMARANG

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ABSTRACT

The aims of this research were to identify the type of stream continuity by determining land physical parameters through remote sensing images, and also to consider the watershed balance during the year. This research located in Garang Watershed, Semarang, Central Java.

Landsat ETM+ digital image scanned at May 1st, 2002 and Aster digital image scanned at September 17th, 2006 were used to estimate the run off coefficient using Cook's method during the rainy and dry season. The meteorological data, the population data, the amount of hotels and industries data, the data of location and springs debits, and the data of groundwater consumption by industries are used to support the calculation of input and output water volume in Garang watershed

The method used in this research were interpreting the Landsat and Aster digital imagery to get the information about the land physical parameters, such as the vegetation density, the surface water storage, and the velocity of infiltration, while the SRTM data had been used to get the information about the slope. Those physical parameters had been overlaid to get the run off coefficient value. The meteorological data was used to determine the input volume during the year, while the volume of the water was used by people and the spring debit were used to determine the output volume. The volume input which had been minused with the output volume produced water balance, that would use in determining the stream continuity.

The results of this research showed that the Landsat and Aster images satellite were capable in interpreting the landuse with 80,76% correctness, 84,61% correctness in interpreting landcover, and 83,33% correctness for land infiltration, while the correctness in interpreting the slope using SRTM was about 83,33%. The estimation of the run off coefficient had more than 90% correctness. During the rainy season, the water balance in Garang watershed had been surplus, while in the dry season it had been deficit in its three sub watershed. The main streams on each sub watershed were acknowledged as the perennial stream which had springs and seepages as the sources, while the upstreams were ephemeral since they had no baseflows.

Keywords : Run off coefficient, water balance, baseflow