KAJIAN KONDISI SUMBER DAYA AIR DI WILAYAH DAS SAMPEAN BARU, KECAMATAN KLABANG, KABUPATEN BONDOWOSO, JAWA TIMUR

Study of Water Resource Conditions in the Sampean Baru Area, Klabang District, Bondowoso Regency, East Java

ABSTRAK

Penelitian ini bertujuan untuk menganalisis kondisi sumber daya air di Daerah Aliran Sungai (DAS) Sampean Baru, Kecamatan Klabang, Kabupaten Bondowoso, sebagai dasar evaluasi ketersediaan air irigasi. Analisis dilakukan menggunakan data curah hujan tahun 2016–2025 dari tiga stasiun hujan serta data klimatologi tahun 2025. Curah hujan efektif dihitung menggunakan peluang 80% (R80), evapotranspirasi acuan menggunakan metode FAO Penman–Monteith, sedangkan ketersediaan air dianalisis dengan metode F.J. Mock. Hasil penelitian menunjukkan bahwa data curah hujan memenuhi uji konsistensi dan curah hujan kawasan sebesar 98,29 mm. Nilai fungsi kecepatan angin berkisar antara 0,620–0,807 km/hari yang memengaruhi evapotranspirasi. Kebutuhan air tanaman padi lebih besar dibandingkan tanaman jagung. Analisis neraca air menunjukkan kondisi surplus pada musim hujan dan defisit pada sebagian besar musim kemarau dengan defisit terbesar mencapai -1,22 l/dt. Hasil penelitian ini diharapkan menjadi dasar dalam pengelolaan sumber daya air serta penyusunan pola tanam yang lebih efektif sesuai ketersediaan air di DAS Sampean Baru. lalu lintas jalan.

ABSTRACT

This study aims to analyze the condition of water resources in the Sampean Baru Watershed, Klabang Subdistrict, Bondowoso Regency, as a basis for evaluating irrigation water availability. The analysis was conducted using rainfall data from 2016 to 2025 collected from three rain gauge stations, as well as climatological data from 2025. Effective rainfall was calculated using an 80% probability (R80), reference evapotranspiration was calculated using the FAO Penman–Monteith method, and water availability was analyzed using the F.J. Mock method. The results show that the rainfall data passed the consistency test and that the regional rainfall was 98.29 mm. Wind speed values ranged from 0.620 to 0.807 km/day, which influenced evapotranspiration. Rice has higher water requirements than corn. Water balance analysis indicates a surplus during the rainy season and a deficit during most of the dry season, with the largest deficit reaching -1.22 L/dt. The results of this study are expected to serve as a basis for water resource management and the development of more effective cropping patterns in accordance with water availability in the Sampean Baru Watershed. cost is Rp18.34 billion, while the alternative design costs Rp10.38 billion, resulting in savings of approximately Rp7.96 billion. These results indicate that the alternative design is more cost-efficient without compromising structural integrity or road traffic safety.