

INTISARI

Daerah Irigasi Serayu merupakan daerah irigasi teknis terletak di kabupaten Banyumas, Cilacap, dan Kebumen. Sumber air irigasi Serayu berasal dari Bendung Gerak Serayu pada koordinat LS 7°31'33.22", BT 109°12'6.75"E. Sistem Irigasi Serayu mampu mencukupi kebutuhan air untuk lahan pertanian seluas 20.795 hektar.

Daerah Irigasi Serayu dijadikan lokasi penelitian karena Balai PSDA Serayu-Citanduy sebagai operator operasi irigasi telah memiliki APEMASI, yaitu Aplikasi Pembagian Air Irigasi berbasis website. APEMASI timbul akibat keluhan dari masyarakat karena air yang sampai ke petani tidak sesuai dengan yang diumumkan seolah tidak transparan. Publikasi APEMASI berupa skema jaringan irigasi dan hitungan kebutuhan air irigasi. Evaluasi APEMASI telah dilakukan terhadap para pengguna aplikasi berupa kuesioner mengenai tingkat kemudahan penggunaan, kepuasan, dan ketepatan distribusi air irigasi. Hasil evaluasi menunjukkan bahwa tingkat keberhasilan APEMASI masih rendah dan sulit dipahami.

Praktik irigasi inovatif diperlukan untuk meningkatkan efisiensi penggunaan air. Pemberian air irigasi tepat waktu, ruang, jumlah, dan mutu merupakan faktor utama pola distribusi air irigasi. Proses sederhana sistem informasi dan pelaporan yang transparan mampu mengurangi konflik pembagian air irigasi dan meningkatkan kinerja petugas operasi irigasi. Penelitian ini mengenalkan perangkat aplikasi untuk penentuan pola tanam berbasis ketersediaan air.

Aplikasi hitung kebutuhan air irigasi dikembangkan dengan *input* nilai evapotranspirasi potensial, hujan andalan, koefisien tanaman, nilai perkolasi, debit andalan, dan luas areal irigasi. *Output* berupa tabel kebutuhan air irigasi total dan grafik pola tanam (hubungan kebutuhan air irigasi dan ketersediaan debit air selama satu tahun). Kebutuhan air irigasi dihitung berdasarkan Standard Kriteria Perencanaan Irigasi (KP-01), 2013. Perhitungan kebutuhan air irigasi dihitung terlebih dahulu untuk digunakan dalam proses verifikasi saat penentuan koding. Pengembangan *software* dibuat melalui bahasa pemrograman PHP. Pendekatan model dilakukan secara sistematis dan berurutan secara bertahap atau *Waterfall Development Model*.

Penentuan pola tanam dilakukan dengan pemilihan opsi tanam yaitu OPSI 1 (PADI-PADI-PADI), OPSI 2 (PADI-PADI-PALAWIJA tanpa pengurangan luas tanam), dan OPSI 3 (PADI-PADI-PALAWIJA luas maksimum). Luas maksimum adalah kondisi dimana luas lahan pertanian mencapai luas maksimum saat ketersediaan air di pintu pengambilan masih cukup. Pengembangan aplikasi dilakukan mengingat banyak parameter dalam hitungan kebutuhan air irigasi. Aplikasi mampu meringkas dan mempercepat proses hitungan kebutuhan air.

Kata Kunci: Distribusi air irigasi, pola tanam, perangkat aplikasi kebutuhan air irigasi.

ABSTRACT

Serayu irrigation area is a technical irrigation area located in Regency of Banyumas, Cilacap, and Kebumen. Its water source comes from Serayu motion weir at coordinate LS 7°31'33.22", BT 109°12'6.75" E. Serayu irrigation can serve the water demand of agriculture area of 20,795 hectares.

Irrigation Serayu area is under control by PSDA Serayu-Citanduy office. It used as the research area because it has a website-based application of irrigation water sharing, well known as APEMASI. APEMASI created as a result of the farmer complaints because of the mismatch of irrigation water distribution not transparent. APEMASI publications in the form of irrigation network schemes and calculation of irrigation water needs. The Serayu-Citanduy Office used a questionnaire to evaluate APEMASI performance. It contains the level of ease of use, satisfaction, and accuracy of irrigation water distribution. The evaluation results show that the success rate of APEMASI is still low and difficult to understand.

Innovative irrigation practices are necessary to improve water use efficiency. Distribution of irrigation water on time, space, quantity, and quality is the main factor in the distribution pattern of irrigation water. The simple process of a transparent information and reporting system can reduce irrigation water sharing conflicts and improve the irrigation operation officers performance. This study introduces an application tool for determining cropping patterns based on water availability.

The calculating application of the irrigation water demand developed with the input data consists of potential evapotranspiration values, dependable rainfall, crop coefficients, percolation values, reliable discharge, and irrigation area. The output is in the form of a table of total irrigation water needs and a graph of cropping patterns (the relationship between irrigation water demands and availability of water discharge for one year). The irrigation water demand calculated based on the Standard Irrigation Planning Criteria (KP-01), 2013. It used for the verification process when determining a coding. Software development uses the PHP programming language. The model approach is carried out systematically and sequentially in stages or well-known as Waterfall Development Model.

The cropping pattern was determined by selecting planting options consists of Option 1 (Paddy-Paddy-Paddy), Option 2 (Paddy-Paddy-Palawija) without a planting area reduction, and Option 3 (Paddy-Paddy-Palawija) with the maximum area. The maximum areal is a condition where the agricultural area reaches its maximum areal when the water availability at the intake gate is still sufficient. Application development was carried out considering the many parameters in the calculation of irrigation water requirements. The application can summarize and speed up the process of calculating water demands.

Keywords: Irrigation water distribution, Cropping pattern, Irrigation water demand application.