

**ANALISIS KEANDALAN PENYEDIAAN AIR  
IRIGASI DALAM MENENTUKAN NILAI INDEKS  
KESIAPAN MODERNISASI IRIGASI**



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# ANALISIS KEANDALAN PENYEDIAAN AIR IRIGASI DALAM MENENTUKAN NILAI INDEKS KESIAPAN MODERNISASI IRIGASI

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ABSTRAK

Modernisasi irigasi merupakan strategi penting dalam mendukung ketahanan pangan melalui pengelolaan sumber daya air yang efisien dan berkelanjutan. Penelitian ini bertujuan untuk menganalisis keandalan penyediaan air irigasi di Daerah Irigasi (DI) Batang Anai, Kabupaten Padang Pariaman, khususnya pada jaringan sekunder BLBA 1 hingga BM 6 dengan luas layanan 1.410 Ha. Permasalahan utama yang dihadapi adalah ketidakseimbangan distribusi air antara wilayah hulu dan hilir, tingginya tingkat kehilangan air pada jaringan irigasi, sarana dan prasarana irigasi, termasuk infrastruktur bangunan yang mengalami kerusakan serta pengaruh aktivitas manusia dan bencana alam. Parameter yang dianalisis meliputi ketersediaan air, kebutuhan air tanaman, dan efisiensi penyaluran air sebagai dasar penilaian Indeks Kesiapan Modernisasi Irigasi (IKMI) pada pilar keandalan penyediaan air. Metode penelitian dilakukan melalui observasi lapangan dan analisis data klimatologi periode 2015–2024. Hasil penelitian menunjukkan bahwa total kebutuhan debit irigasi untuk komoditas padi dan palawija sebesar 800,2 L/det, sedangkan debit rata-rata yang tersedia hanya 481 L/det, sehingga terjadi defisit air. Nilai ketersediaan air sebesar 0,60, keandalan air tanaman 2,60, dan efisiensi saluran irigasi 60,6%, yang mengindikasikan bahwa sistem masih berfungsi namun belum optimal. Berdasarkan perhitungan IKMI, diperoleh nilai sebesar 52% dengan kategori cukup. Hal ini menunjukkan bahwa modernisasi irigasi belum dapat diterapkan secara langsung dan perlu ditunda selama 1-2 tahun disertai penyempurnaan sistem melalui rehabilitasi jaringan, peningkatan efisiensi saluran, pengendalian kehilangan air, serta optimalisasi operasi dan pemeliharaan (O&P).

**Kata Kunci:** IKMI, modernisasi Irigasi, CROPWAT 8.0, Keandalan Air, D.I. Batang Anai.

# ANALYSIS OF IRRIGATION WATER SUPPLY RELIABILITY IN DETERMINING THE IRRIGATION MODERNIZATION READINESS INDEX

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ABSTRACT

Irrigation modernization is an important strategy in supporting food security through efficient and sustainable water resource management. This study aims to inform the provision of irrigation water in the Batang Anai Irrigation Area (DI), Padang Pariaman Regency, especially in the secondary network BLBA 1 to BM 6 with a service area of 1,410 Ha. The main problems faced are the imbalance in air distribution between upstream and downstream areas, the high level of air loss in the irrigation network, irrigation facilities and infrastructure, including damaged building infrastructure and the impact of human activities and natural disasters. The parameters analyzed include air availability, plant air requirements, and air distribution efficiency as the basis for assessing the Irrigation Modernization Readiness Index (IKMI) on the air supply permit pillar. The research method was carried out through field observations and analysis of climatological data for the period 2015–2024. The results showed that the total irrigation discharge requirement for rice and secondary crops was 800.2 L/s, while the average available discharge was only 481 L/s, resulting in a water deficit. The air availability value was 0.60, the crop air resolution was 2.60, and the irrigation channel efficiency was 60.6%, indicating that the system was still functioning but not optimally. Based on IKMI calculations, the value obtained was 52%, which is categorized as sufficient. This indicates that irrigation modernization cannot be implemented immediately and needs to be postponed for 1-2 years, accompanied by system improvements through network rehabilitation, increasing channel efficiency, controlling air loss, and optimizing operations and maintenance (O&M).

**Keywords:** Irrigation Modernization, Water Supply Reliability, Irrigation Efficiency, Water Loss, IKMI

