



Abstract

Tenganan Indigenous Village in Bali is renowned for its strong local wisdom in managing natural resources, particularly water. This study aims to assess the water resource carrying capacity based on ecosystem services, incorporating both ecological and socio-cultural values of the community. The analysis was conducted using a water balance approach (supply-demand) and an ecosystem service index assessment based on three main indicators: land use, landform, and socio-cultural factors. Data were collected through field observations, interviews, community surveys, and spatial analysis, and analyzed using the Analytical Hierarchy Process (AHP). The results show that water availability from springs is sufficient to meet domestic, industrial, and livestock needs, while agricultural water demand varies across hamlets—three are in surplus and two in deficit. The ecosystem service index for water provision is dominated by high and very high classes, covering 87.3% of the village area. Priority management strategies include customary law-based water regulation (*awig-awig*), conservation of customary forests through agroforestry, spring rehabilitation, and the development of environmentally friendly water infrastructure. This study emphasizes the importance of integrating ecological approaches and local wisdom in sustainable water resource management.

Keywords: ecosystem services, water carrying capacity, Tenganan Village, *awig-awig*, AHP, local wisdom



Abstrak

Desa Adat Tenganan di Bali dikenal memiliki sistem kearifan lokal yang kuat dalam pengelolaan sumber daya alam, khususnya air. Penelitian ini bertujuan untuk mengkaji daya dukung sumber daya air berbasis jasa ekosistem dengan mempertimbangkan peran ekosistem dan nilai sosial budaya masyarakat. Analisis dilakukan melalui pendekatan neraca air (supply-demand) dan penilaian indeks jasa ekosistem penyediaan air berbasis tiga indikator utama: penggunaan lahan, bentuk lahan, dan sosial budaya. Data dikumpulkan melalui observasi, wawancara, survei masyarakat, dan analisis spasial, serta dianalisis menggunakan metode AHP. Hasil menunjukkan bahwa ketersediaan air dari mata air di desa dapat mencukupi kebutuhan domestik, industri, dan peternakan, namun kebutuhan air pertanian menunjukkan variasi daya dukung antardusun, dengan tiga dusun mengalami surplus dan dua lainnya defisit. Indeks jasa ekosistem penyediaan air didominasi oleh kelas tinggi dan sangat tinggi yang mencakup 87,3% wilayah desa. Strategi pengelolaan yang diprioritaskan meliputi regulasi air berbasis hukum adat (awig-awig), pelestarian hutan adat melalui agroforestri, rehabilitasi mata air, serta peningkatan infrastruktur air ramah lingkungan. Kajian ini menegaskan pentingnya integrasi pendekatan ekologis dan kearifan lokal dalam pengelolaan sumber daya air yang berkelanjutan.

Kata kunci: jasa ekosistem, daya dukung air, Desa Tenganan, awig-awig, AHP, kearifan lokal