Penghitungan Daya Dukung dan Analisis Limits of Acceptable Change di Area Wisata Pendakian Ranu
Kumbolo, Taman Nasional Bromo Tengger Semeru
Seca Embun Nugrahini, Ir. Retno Nur Utami, MP
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PENGHITUNGAN DAYA DUKUNG DAN ANALISIS *LIMITS OF ACCEPTABLE CHANGE* DI AREA WISATA PENDAKIAN RANU KUMBOLO, TAMAN NASIONAL BROMO TENGGER SEMERU

Seca Embun Nugrahini[1], Retno Nur Utami[2]

INTISARI

Tingginya minat kunjungan pendakian di Ranu Kumbolo berpotensi menimbulkan tekanan terhadap vegetasi, kebersihan, kualitas air, dan kenyamanan pengunjung. Kuota pendakian sebesar 300 orang per hari masih ditetapkan berdasarkan perkiraan kapasitas area berkemah dan ketersediaan pemandu, belum berdasarkan kajian ilmiah. Penelitian ini bertujuan menghitung daya dukung fisik, riil, dan efektif serta menilai batas perubahan yang masih dapat diterima di area wisata pendakian Ranu Kumbolo.

Penelitian dilaksanakan pada Januari-Februari 2026 di jalur pendakian Ranupani-Ranu Kumbolo, Taman Nasional Bromo Tengger Semeru, Kabupaten Lumajang. Data primer diperoleh melalui pengukuran lapangan, observasi, wawancara, dan kuesioner daring kepada 133 pendaki yang berkunjung pada 2025. Data sekunder diperoleh dari Balai Besar TNBTS dan BMKG. Daya dukung dianalisis menggunakan metode Cifuentes yang mencakup *Physical Carrying Capacity, Real Carrying Capacity*, dan *Effective Carrying Capacity*. Kondisi ekologis dan sosial dinilai melalui pendekatan *Limits of Acceptable Change* menggunakan indikator dan skoring risiko.

Hasil menunjukkan nilai PCC jalur sebesar 3.192 pengunjung per hari dan PCC area berkemah sebesar 1.144 pengunjung per hari. Setelah dikoreksi berdasarkan faktor sosial, curah hujan, angin, dan kelerengan, diperoleh RCC jalur sebesar 1.345 pengunjung per hari dan RCC area berkemah sebesar 482 pengunjung per hari. Kapasitas manajemen sebesar 95,24% menghasilkan ECC sebesar 459 pengunjung per hari. Nilai tersebut berada di atas kuota aktual, sehingga kuota 300 pengunjung per hari masih berada dalam batas aman. Analisis LAC menghasilkan skor 12 dengan kategori intervensi sedang. Sampah menjadi indikator berisiko tertinggi sehingga pengelolaan kebersihan perlu diprioritaskan.

Kata Kunci: daya dukung wisata, ekowisata berkelanjutan, kuota pendakian, pengelolaan kawasan, risiko lingkungan

[1] Mahasiswa Fakultas Kehutanan UGM
[2] Staff Pengajar Fakultas Kehutanan UGM

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CARRYING CAPACITY ASSESSMENT AND LIMITS OF ACCEPTABLE CHANGE ANALYSIS IN THE RANU KUMBOLO HIKING TOURISM AREA, BROMO TENGGER SEMERU NATIONAL PARK

Seca Embun Nugrahini[1], Retno Nur Utami[2]

ABSTRACT

Hiking at Ranu Kumbolo may increase pressure on vegetation, cleanliness, water quality, and visitor comfort. The daily quota of 300 hikers is based on estimated camping capacity and guide availability rather than scientific assessment. This study aimed to calculate the physical, real, and effective carrying capacities and assess acceptable change in the Ranu Kumbolo hiking area.

The study was conducted from January to February 2026 along the Ranupani-Ranu Kumbolo trail in Bromo Tengger Semeru National Park, Lumajang Regency. Primary data were collected through field measurements, observation, interviews, and an online questionnaire completed by 133 hikers who visited in 2025. Secondary data were obtained from the national park authority and the Indonesian Agency for Meteorology, Climatology, and Geophysics. Carrying capacity was assessed using the Cifuentes method, comprising Physical, Real, and Effective Carrying Capacity. Ecological and social conditions were evaluated using the Limits of Acceptable Change approach and risk scoring.

The trail PCC was 3,192 visitors per day, while the camping-area PCC was 1,144 visitors per day. After correction for social conditions, rainfall, wind speed, and slope, the trail RCC was 1,345 visitors per day and the camping-area RCC was 482 visitors per day. A management capacity of 95.24% produced an ECC of 459 visitors per day. This exceeded the current quota, indicating that 300 visitors per day remains safe. The LAC assessment scored 12 and required moderate intervention. Waste disturbance was the highest-risk indicator, making cleanliness management the main priority.

Keywords: *carrying capacity, sustainable ecotourism, hiking quota, protected-area management, environmental risk*

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[1] Mahasiswa Fakultas Kehutanan UGM
[2] Staff Pengajar Fakultas Kehutanan UGM