ABSTRAK

Danau Teloko di Kabupaten Ogan Komering Ilir memiliki peran penting sebagai sumber air baku, pertanian, dan kawasan wisata. Namun, peningkatan aktivitas manusia dan perubahan iklim menimbulkan risiko ketidakstabilan lereng (outlide) serta gangguan terhadap bangunan pengendali air. Penelitian ini bertujuan untuk mengkaji stabilitas outlide dan bendung pada Danau Teloko melalui analisis hidrologi, hidrolika, dan geoteknik. Metode yang digunakan meliputi analisis curah hujan, debit banjir rencana, pemodelan aliran menggunakan HEC-RAS, serta perhitungan stabilitas struktur terhadap guling, geser, daya dukung tanah, uplift, dan piping.

Hasil penelitian menunjukkan bahwa debit banjir rencana kala ulang 100 tahun yaitu 468,9 m^3/dtk digunakan sebagai dasar desain. Dari hasil analisis data menggunkan aplikasi HEC-RAS diketahui tinggi muka air outlet pada danau Teloko = 5,9 m, elevasi muka air di atas mercu = 1,4 m, tinggi jagaan = 2,1 El.m, stabilitas bendung menunjukkan seluruh faktor keamanan stabilitas bendung terhadap guling > 1,5 tm = 49,2 tm > 1,5 tm, stabilitas bendung terhadap geser > 1,5 tm = 2,58 tm > 1,5 tm, stabilitas bendung terhadap daya dukung tanah > 3 tm = 63,5 tm > 3 tm, stabilitas bendung terhadap angkat > 1,2 tm = 1,27 tm > 1,2 tm, stabilitas bendung terhadap piping > 3 tm = 5,08 tm > 3 tm.

Analisis stabilitas bendung menunjukkan seluruh faktor keamanan memenuhi persyaratan teknis, sehingga struktur dinyatakan aman terhadap kegagalan. Kajian ini diharapkan dapat menjadi dasar pengelolaan danau serta mitigasi risiko outlide di Danau Teloko.

ABSTRACT

Lake Teloko in Ogan Komering Ilir Regency plays an important role as a source of raw water, agricultural irrigation, and a tourism area. However, increasing human activities and climate change pose risks of slope instability (outslide) and potential disturbances to the water control structure (weir). This study aims to evaluate the stability of the outslide and the weir at Lake Teloko through hydrological, hydraulic, and geotechnical analyses. The methods used include rainfall analysis, design flood discharge calculation, flow modeling using HEC-RAS, and structural stability analysis against overturning, sliding, bearing capacity failure, uplift, and piping.

The results show that the 100-year return period design flood discharge of 468.9 m³/s was used as the design basis. Based on data analysis using the HEC-RAS application, the outlet water level at Lake Teloko is 5.9 m, the water level above the crest is 1.4 m, and the freeboard height is 2.1 m. The weir stability analysis indicates that all safety factors meet the required criteria: stability against overturning > 1.5 (49.2 > 1.5), stability against sliding > 1.5 (2.58 > 1.5), stability against bearing capacity failure > 3 (63.5 > 3), stability against uplift > 1.2 (1.27 > 1.2), and stability against piping > 3 (5.08 > 3).

The overall stability analysis demonstrates that all safety factors satisfy technical requirements, indicating that the structure is safe against failure. This study is expected to serve as a basis for lake management and outslide risk mitigation at Lake Teloko.