

DENUDATION RATE IN GUNUNGSEWU KARST AREA, GUNUNGKIDUL REGENCY

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(20/454967/GE/09201)

ABSTRACT

Karst denudation is the process of lowering the karst surface due to dissolution processes. The Gunungsewu Karst area is one such karst experiencing denudation processes. This research aims to determine the rate of denudation in the Gunungsewu Karst area. The objectives of this study are as follows: 1) to quantify the rate of denudation in the Gunungsewu Karst area, and 2) to compare the rate of denudation between the epikarst drainage system and the underground river system. The rate of karst denudation is calculated based on dissolved CaCO_3 content, flow discharge, and the area of the water catchment area over one year. The data used include primary data from field measurements and secondary data from previous studies. The measured data is then calculated to determine the denudation rate in the epikarst drainage system and the underground river system. The results of this study indicate that the denudation rate in the Gunungsewu Karst area is $90.08 \text{ m}^3/\text{km}^2/\text{year}$ or 0.09 mm/year , with the epikarst drainage system contributing to a denudation rate that is double that of the underground river system. The dissolution process mostly occurs in the soil-bedrock interface zone, with carbon dioxide sources originating from the atmosphere and soil. The geomorphological, geological, and soil conditions affect the denudation rate in the Gunungsewu Karst area. In the epikarst drainage system, characterized by a closed system, the degassing process of carbon dioxide is smaller compared to the underground river system with an open system.

Keywords: denudation, epikarst, underground river, dissolution