

Limnological Characteristics of Volcanic Lake at the Dieng Volcanic Complex, Centra Java

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ABSTRACT

Lakes in volcanic environments are an essential source of water for people's lives. On the other hand, the lake's sustainability is highly dependent on the way of life of the population in the region. Limnological studies conducted on many lakes in a volcanic complex are an exciting topic to discuss. This study aims to analyze the limnological characteristics of various lakes in the Dieng Volcanic Complex, Central Java. This study provides alternative information on the geomorphological and hydrological conditions of the lakes in the volcanic complex. This study also offers new insights into the limnological characteristics of lakes in a wet tropical volcanic complex with diverse volcanic activity. The findings of this study offer such novelty, considering that previous studies in the last ten years have generally discussed the chemical and gas characteristics of volcanic lakes.

A descriptive-exploratory research design was used with a geographic approach, namely a spatial approach. This research also implements geography themes in analyzing problems: location, place, human-environment interaction, movement, region, and landform. The subject of this research is a volcanic lake in the Dieng Volcanic Complex, while the object of research is the morphological and hydrological characteristics of the lake. Data was collected by observation, remote sensing image interpretation, literature study, and documentation. The data obtained were then analyzed using GIS, statistical, and descriptive analysis.

This research obtained several significant findings: (1) Volcanic lakes and ponds in the Dieng Volcanic Complex are formed in various basin morphologies: caldera, inter-stratocone basin, crater basin, and stratocone slopes. This study compiled a typology of lakes and ponds: caldera lake, Inter-stratocone basin lake, Inter-stratocone basin lake, Crater basin lake, and Stratocone slope lake. (2) Lakes and ponds have diverse morphology and morphometry. The typology of lakes and ponds does not determine morphometry. Geomorphic processes that occur are dominated by erosion, sediment deposition, and material deposition from phreatic eruptions. (3) The hydrological characteristics of volcanic lakes and ponds are diverse. In volcanic lakes, there is a tendency for water temperature to decrease with depth. However, this symptom does not occur in other water quality parameters, namely pH, DO, TDS, and EC.

Kata Kunci: *Volcanic lake, limnology, water quality, Dieng, Indonesia*