

Assessment of Unusual Rock Weathering in Samanalawewa Area in Sri Lanka

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Abstract

The research investigates the unusual rock weathering at Samanalawewa dam in Sri Lanka and its significant impact on the dam structure and surrounding area. While previous investigations covered physical, mechanical, chemical, and mineralogical properties, limited attention was given to physical observations. A comprehensive approach was conducted from physical observations, rock sample analysis, and scanning electron microscopy (SEM) to gain a deeper understanding of the weathering mechanisms and potential structural weaknesses. Samples were collected from the quarry site and surrounding locations based on geological maps from 13 locations in both fresh and weathered states. Various rock types were included, such as charnockite (CHA), garnet sillimanite biotite gneiss (GBN), marble (MAR), and khondalite (KHO). Physical observations focused on identifying distinct weathering patterns, colours, and textures on the rock surfaces. These changes happened only in the dam quarry site, not in the surrounding area in the Samanalawewa area. The SEM analysis provided valuable insights into elemental changes. Despite thorough examination, this research did not identify a significant correlation between the observed rapid weathering and the geological characteristics of the Samanalawewa dam and its vicinity. Further investigations are required to unveil the underlying factors responsible for this geological phenomenon and its potential implications for the dam's stability and long-term viability.

Keywords: Charnockite, Garnet sillimanite biotite gneiss, Khondalite, Quarry, Scanning electron microscopy (SEM), Unusual rock weathering