Report On Mini Project

GRANULAR DEBRIS FLOW IN THE HIMALAYAN REGION

Submitted by

Group no-11

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CERTIFICATE

Certified that the Mini project report entitled "Granular debris flows in the Himalayan region" submitted by Agidi Koushik, Kongalla Anitha, Purushottam Das Mahant, and Supriya Kumari of B. Tech 4th Semester, in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering and Technology Guru Ghasidas Vishwavidyalaya, Bilaspur is accorded to the student's work, carried out by them in the Department of Civil Engineering during session 2023-24 under my supervision and guidance.

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ABSTRACT

Debris flows, particularly those involving granular materials, pose significant natural hazards in the Himalayan region of India. This review synthesizes current knowledge on the mechanical behavior of granular debris flows and evaluates the multifaceted causes leading to landslides in this ecologically sensitive and geologically dynamic area. We explore the physical properties of granular debris, such as particle size distribution, shape, and material composition, and discuss how these characteristics influence the flow behavior and susceptibility to landslides. Human activities, including deforestation, construction, land use changes, and climatic factors such as intense rainfall and rapid snowmelt, are examined to understand their compounding effects on landslide frequency and severity. The review also addresses other natural and man-made factors contributing to the destabilization of slopes. Additionally, this paper highlights innovative and traditional landslide risk reduction measures, focusing on engineering solutions and community-based approaches adapted to the unique challenges of the Himalayan terrain. Preventive strategies such as slope stabilization, early warning systems, and policy interventions are discussed to provide a comprehensive overview of mitigating these destructive events' impact. By integrating geotechnical engineering, environmental science, and disaster risk management studies, this review offers actionable insights for researchers, practitioners, and policymakers engaged in enhancing landslide resilience in the Himalayan region.

Keywords: Granular Debris Flow; Himalayan Geohazards; Slope Stability; Landslide Mitigation