A Community-Driven Approach to Landslide Hazard Mapping, Risk Assessment and Management in Nepal

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SUMMARY

Landslides are the third most common natural disaster in Nepal, with substantial socioeconomic and environmental consequences. Addressing this prevalent problem necessitates a robust and comprehensive strategy. This study intends to emphasize a multifaceted approach to landslide risk management in Nepal by combining community-based mitigation measures, hazard mapping, and hydro-geological investigation. Amilee Landslide located in Ayirabati rural municipality of Pyuthan District represents one of the most significant natural disasters in Nepal. Causes of landslides, hazard extent, and risk are assessed by conducting extensive field surveys, mapping, and Kinetic analysis to evaluate slope stability. The study utilizes the data on lithology, landslide characteristics, and socio-economic conditions that were systematically collected from the field. The DIPS (Distinct Element Program for Slope Stability) application was used to analyze the possible failure modes. A slope stability study revealed major risks from planar and wedge sliding. The study revealed that human activities, particularly road development and land compaction, are the leading drivers of landslides in that area, followed by geological conditions defined by weakly compacted purple shales prone to weathering and fracturing. A detailed damage assessment was carried out, mapping all critical infrastructure and assessing the risks to these structures. The study suggests a variety of short-term, mid-term, and long-term strategies for landslide mitigation. Short-term solutions include drainage management, bioengineering, gully treatment, and stabilization of slopes. Mid-term strategies include improving research, data collection, risk mapping, and building early warning systems. Long-term solutions promote sustainable land use planning, reforestation, and the development of resilient infrastructure. In conclusion, the study emphasizes the importance of a multifaceted approach to landslide risk management in Nepal. By combining geological studies with community-focused mitigation plans, susceptible areas' resilience can be significantly increased, ultimately safeguarding lives and livelihoods.