

Shaped by landslides – how interacting tectonics, lithology and urbanisation define slope stability in Bukavu and the Ruzizi Gorge (DR Congo)

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Abstract:

Landslides are geo-hydrological hazards that both shape landscapes and pose significant risks to communities. Despite their widespread impacts, the geomorphological and geological factors controlling their occurrence are often not well understood. This is especially so in mountainous tropical regions where environmental conditions, such as bedrock type and soil weathering can be specific. This research investigates the influence of these factors on landslide activity in the tropical African environment of the Ruzizi Gorge and the adjacent city of Bukavu, which ranks among the world's most exposed urban areas to landslide hazards. By reconstructing the geomorphological evolution of the landscape and combining UAV, optical and SAR remote sensing data, we examine how slow-moving landslides occur and evolve in this region. Our findings highlight the roles of river incision and weathering as key controls, while also revealing the significant impact of urbanisation on slope instability. We conclude by discussing the implications of these findings for assessing risks associated with slow-moving landslides in this complex and evolving environment.