SINKHOLES OCCURRENCE IN GRANITE FORMATION – FIELD EVIDENCE

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Abstract - Sinkholes are depressions or holes formed on the ground due to the collapse of the surface layer. They are a problem because they can cause damageand instability to buildings. Sinkholes are typically known to occur in limestone or karst regions due to the dissolution nature of the rocks. Although sinkholes are not common in granite rock, some studies have shown that on steep slopes where there is sufficient water-rock interaction some granite rock-forming minerals are significantly unstable and therefore vulnerable to dissolution which can lead to the formation of cavities and the possibility. In a rare observation, the study presents field evidence to show the occurrence of sinkholegranite terrain in Eswatini, Southern Africa. This is followed by a geophysical assessment to understand the subsurface nature of the site and its likely influence on sinkhole formation. Evidence includes sinkholes of different sizes, underground streams, and cavities on top of the granite rock outcrops. The sinkholes are classified as typically "typical dissolution-collapse sinkholes. The geophysical models show the presence of a weathered zone from 15 to 70 m depth. It is inferred that that the formation of sinkholes is driven by the dissolution in the weathered granite zone creating channels and subsequent collapse, then the whole stretch can be classified as vulnerable to sinkhole formation. Recommendations were made to conduct a large-scale investigation in the area to assess the sinkhole formation vulnerability to inform property developers of the potential risks.

Keywords - Dissolution; Geophysical assessments;Granite rocks;Sinkholes; Weathering