



Seminario

Clay mineral influence upon the stability of a landslide affected area in Cluj-Napoca (Transylvania, Romania)

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Abstract:

The southern slope of the Cetățuia-Hoia hill, located in the urban setting of Cluj-Napoca, Romania, is made-up of clayey continental “red-bed” deposits. Although documented as a landslide prone area, the slope receives increased attention due to urban development. The slope stability was investigated through geological-geomorphological mapping and core drillings. Core samples were taken for physico-mechanical and mineralogical investigations.

An old, deep-seated landslide, flowing events and anthropic interventions shape the slope morphology. Tension cracks, fractures and failure structures favour water infiltration and circulation within the landslide body. The deposits are generally active, expansive and display medium to high plasticity, having effective friction angles of 6.7-33.7° and effective cohesion strengths of 7-73 kPa. Their physical and mechanical properties are affected by the type and amount of clay-sized minerals, especially by illite-smectite interstratifications and illite. The abundance of these minerals may explain the activity, expansive behaviour and susceptibility to plastic deformation of the deposits, as well as the decrease in effective friction angles with the amount of clay-size particles present. Such properties together with the presence of tension cracks, pre-sheared clays, water infiltration and high slope angles compromise slope stability and could induce landslide reactivation.

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