

Landslides in the Enguri River Basin: Triggering Factors and Assessment Analysis

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Svaneti is one the most landslide-prone regions of Georgia, a condition determined by its rugged relief, steep slopes, the dense network of tributaries of the Enguri River, and weak, water-saturated geological formations. Landslide processes in the region result from the combined influence of natural factors – such as climatic conditions, precipitation intensity, snowmelt, and geological structure – and anthropogenic activities, including road construction, deforestation, and unsystematic slope exploitation.

The study reviews several well-known large-scale landslide events from the history of Svaneti, including the Khaishi landslide (Kvemo Svaneti, 1987), the Mestia landslide (Zemo Svaneti, 2015), the Kala landslide (2019), the Mulakhi landslide (2021), and others.

The primary causes of landslide activation in the region include

1. Geomorphological conditions – steep slopes, deeply incised valleys, and flysch and clay-rich rocks that readily lose stability when saturated with water;
2. Climatic factors – intense rainfall, heavy snowfall, and rapid snowmelt in spring, which significantly reduce slope stability;
3. Anthropogenic impact – road construction, reduction of forest cover, and uncontrolled slope development, which accelerate natural geomorphic processes.

Landslides in Svaneti pose a direct threat to human life and cause significant damage to infrastructure, transportation networks, cultural heritage sites, and agricultural land. Their consequences may also include river channel blockage and the triggering of secondary natural hazards, such as flash floods and debris flows.

Effective landslide risk management in Svaneti requires continuous geological and geomorphological monitoring, the preparation of hazard zonation maps, slope stabilization and reinforcement measures, forest restoration, and public awareness-raising about natural hazards. The implementation of these measures can enhance the safety of the living environment and mitigate the negative impacts of landslides on tourism development and the regional economy.