



Landslide and debris flow hazard mapping and assessment in slopes and gullies in coarse grained soils in Sweden

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The frequency of landslides and debris flows, occurring in the more denser populated areas in Sweden, has been rather low in slopes in coarse grained soils. However, during the last decade, some heavy rains have triggered landslides and debris flows, which affected populated areas in different parts of the country. Ski resorts, but also other populated areas situated in hilly landscapes, have been affected. Further, the predicted global climate change indicates an increasing amount of precipitation in the Scandinavian region, mostly due to a higher frequency of heavy rains. Therefore, a national practice for landslide mapping and hazard assessment has turned out to be essential.

By commission of the Swedish Rescue Services Agency, the Swedish Geotechnical Institute, SGI, has developed a landslide and debris flow mapping and hazard assessment method to meet the risks for loss of human life and property. The work has been carried out partly in co-operation with the Chalmers University and the Swedish Meteorological and Hydrological Institute. Support has been given by the Austrian Service for Torrent and Avalanche Control.

The developed mapping method contents three steps:

1. overview mapping based on air photo interpretation, field studies, outlined topographical criteria and the soil-layer and hydrological conditions
2. detailed investigations based on stability calculations and field inventories of the local topography, and the local soil mass distribution, as well as the precipitation, vegetation and run off conditions

3. selection, localisation and design of preventive measures.

The paper will describe the developed method and its three investigation steps, included in the Swedish landslide and debris flow risk policy.