



The impact of clay minerals on mass movements

Katrin M. TIEFENBACH¹, Franz OTTNER

¹*Institute of Applied Geology, University of Applied Life Sciences, Peter-Jordan-Str. 70, A-1190 Vienna;
h0240419@edv1.boku.ac.at*

The main reason for the occurrence of mass movements and landslides are mostly expandable clay minerals contained in sedimentary rocks. Due to their small grain size and other specific properties they influence the mechanical behaviour of rocks very strongly. Their decreasing the stability through water absorption causes the initially mentioned problems.

In Austria, flysch sediments are widely spread from Vienna in the East to Vorarlberg in the West. Flysch consists of very stable sandstones on the one hand and soft, unstable clay marls on the other. For a long time, these marls have been known responsible for mass movements in this geological zone.

This project deals with the classification of mass movements and the characteristics of clay minerals in general whereas special attention is paid to how clay minerals influence landslides. Within this project it is analysed to what extent the distribution of the different types of clay minerals contribute to the formation of gliding layers.

This question is applied on two sites in Upper and Lower Austria where slope instability is a problem. One of the main problems are buildings situated on such unstable slopes. Very often, buildings are affected and sometimes even destroyed by those mass movements. Since this is also an economic issue, counteraction must be taken.

On the purpose of determining the mineralogy and especially the clay content of those geological units, samples were taken from drill cores, prospectings, and probes and were examined by means of bulk and clay mineral analysis. High amounts of mixed layer minerals, smectite, and illite were found. There seems to be a correlation between the occurrence of those minerals and the gliding tendency of the observed slopes.