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Types of mass movements in the Xiangxi Catchment (Three Gorges Reservoir) and their correlation to layering and strata

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In the German YANGTZE Project (funded by the German Federal Ministry for Education and Research), mass movement hazards are investigated in the Xiangxi Catchment which is part of the Three Gorges Reservoir (P. R. China). The objective of our sub-project is to investigate the impact of the Three Gorges Reservoir on slope stability and (re-)activation of mass movements. Investigations have started in summer 2008. First investigations (geological and geotechnical mapping) are finished and prepare the base for more sophisticated analyses in the second half of the project. First results of the field investigations are presented.

The Xiangxi River is orientated generally in North-South direction. Layering is dipping with about 30 to 35 degrees into Western directions forming an asymmetrical valley. In East-West direction, Precambrian to Jurassic strata is exposed.

Field investigations showed that especially Silurian marls and Jurassic claystones and siltstones are most prone to deep seated landslides. Most of them are rotational landslides transforming into translational landslides in the toe area. Less frequently shallow rotational landslides have been observed in Ordovician strata (intercalations of limestones and claystones). In Precambrian to Cambrian and also in Devonian to Permian strata (mainly limestones and dolostones), no landslides could be observed. These hard rocks are sometimes prone to rock fall activity. Triassic sandstones and limestones form mainly the Eastern slopes of the Xiangxi Valley. They are normally stable, only the top formations T2b and T3s have a high clay content and are prone to big translational landslides parallel to the bedding.