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1 The Denudation and Deterioration of Flysch as a Cause of Landslide Enlargement

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The Slano blato landslide (West Slovenia) is more then 1300 m long, 70 to 150 m wide and 3 to 12 m deep with the volume of about 1.000.000 m^3 and means a serious danger for app. 70 houses in the nearby village. It is located in the Tertiary flysh region with the limestone overthrust in the direct vicinity above the landslide. The moving masses consist mainly of clayey gravel of weathered flysc rocks, while a minor phase represents particles of limestone. The sliding surface is on the contact between the fysch rock and 3 – 12 m thick layer of weathered products. During the period of heavy rain, when the sliding masses became saturated, it moves mainly as a gravel flow in the upper part and as a mud flow in the lower part of the area. In dry periods or in freezing conditions it behaves as a group of several landslides, which are temporary in stagnation. According to the written data, in the year 1887, the landslide flew as a liquid flow and reached and destroyed the main road in the valley. The large mass movement culminated again in the autumn 2000, triggered during the period of very heavy rain. After 2000, large mass movements were periodically repeated and observed during each wet autumn season from 2000 to 2004. To protect the village, a small rock fill dam was built and in rainy periods a removal of mud is necessary to maintain a safe conditions for the village. The extensive investigations and observations, which were made within the last 4 years show, that the surface of the landslide area has been widened for another 25 000 m^2 mostly on to the territory of strongly denudated flysch rock and another 20 000 m^2 of area became potentially unstable. Even more, geophysical measurements, made in 2003 and 2004 show, that within the

period of 1 year, the flysch rocks beneath the contact with the unstable masses were significantly deteriorated and that the thickness of weathered flysch increased for up to 5 m. Investigation also showed, that the intact fysch claystone is very sensitive to weathering and that due to the weathering, combined with the denudation, each 1 m^3 volume of potentially unstable flysch turns into app. 2 – 2.5 m^3 of moving masses. The process is still in progress and this is the reason, that an extensive protection and rehabilitation measures have been proposed and are under construction.