Geophysical Research Abstracts
Vol. 13, EGU2011-685-2, 2011
EGU General Assembly 2011

An Assessment of the Rainfall-induced Gundog[U+009F]du (Rize, Northeastern Turkey) landslides and flooding: A perspective of Geotechnical and Geomorphological characteristics.

Aykut Akgün (1), Zekai Angın (2), Sabriye Banu İkizler (3), and Gökhan Demir (4)

(1) Department of Geological Engineering, KTU, Trabzon, Turkey(aykutakgun@gmail.com), (2) Department of Civil Engineering, KTU, Trabzon, Turkey (zekai-angin@hotmail.com/+904623772606), (3) Department of Civil Engineering, KTU, Trabzon, Turkey(banuh73@gmail.com/+904623772606), (4) Department of Civil Engineering, KTU, Trabzon, Turkey (gokhandemir61@hotmail.com/+904623772606)

The Rize province (Northeast of Turkey) is one of the most important landslide-prone area of Turkey. The mean annual rainfall value exceeds 2200 mm in the area. The morphology is mountainous and the steep slopes densely cover the area. Due to the climatic conditions, weathered lithological units are common. When considering all these factors, the landslide susceptibility of the region increases. In this study, a geological, geomorphological and geotechnical assessment of the Gündoğdu (Rize) landslides were carried out. Many landslides and a very destructive flooding occurred in 26 August 2010 because of heavy rainfalls, which 348 kilograms rainfalls falled into the area, and 13 people died and several buildings were damaged as results of these natural hazards. During the heavy rainfall, the stream, acrossing the Gündoğdu town, become the source of flooding. This flooding eroded the slope toes, and because of the fact that this adverse action triggered many mass movements along the stream valley. In the area, andesite and basaltic andesite rocks exposed. These rocks are weathered, and the weathering grades are mainly high and completely weathered. The weathering depth are between the 2 to 3 meters, and this condition constitutes an important base of mass wasting potential in the area. In order to further geotechnical assessments, some index and shear strength parameters of the completely weathered and residual soil material were determined. For this purpose, two locations were sampled, and both undisturbed and disturbed soil samples were taken from the scarps of the landslide areas. The reason of sampling only two locations was the all soil materials in the area are the same. In this context, natural water content, bulk density, internal fraction angle and cohesion of the soil were determined to be 56%, 2,39, 22,49 kN/m2 and 24.660 respectively. Using these values, further geotechnical assessments will be carried out, and the stability conditions of the slopes exposed will be studied in details by deterministic approaches. The expected results will be shared with the local authorities and important engineering remedial measurements will be proposed to prevent further live losses and to mitigate property losses.

Keywords: Landslide, Rainfall,Geotechnics, Turkey