Investigation on Landslide Slope Evolution Processes for Disaster Mitigation

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Mountain and hilly terrain in Japan are predominantly composed of landslide slopes of both recent and ancient origin that often induce slope instability problems. The author discusses the significance of the investigation on slope evolution processes to landslide disaster mitigation through some case studies. Active landslides are often observed in and around sagging (mass rock creep) slopes and rock slide slopes of larger scale. Progressive slope evolution models from sagging or primary rock slides to smaller landslides that are common in the landslide-prone geological zones in Japan are important for the identification of unstable slopes and the assessment of hazard levels. Slope evolution processes of an engineering project site such as dam or road construction and its surrounding area can be formulated from air-photo interpretation and underground geological exploration data. They contribute to basic designing of landslide remedial works. A retrogressive landslide slope evolution case induced by river cutting is presented as an example.

Key words: Japan, landslides, slope evolution, sagging, hazard assessment

Evaluation of Rock Fall Disasters by Geomorphometry using DEMs

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The danger of rock fall disasters is evaluated by the topographic analysis of aerial photographs and the geologic analysis based on field surveys. These methods require high-level technique of engineers and, therefore, the analytical results involve errors due to the difference in the technical levels of the engineers. Generally, the results of these methods are qualitative. Therefore, we must establish a quantitative method that leads the engineers to the same results in the evaluation of rock fall disasters. The geomorphometry using DEMs meshed in 50m grids was implemented to evaluate the danger or rock fall disasters on the Kitakami Mountains and the Shikoku Island. In the Kitakami Mountains, many geomorphometric data at the points in which the rock fall disaster occurred show distorted frequency distributions when compared with the frequency distributions of the data of the whole area of the Mountains. The dispersions of altitude and the steepness index become remarkably higher at the rock fall points. The geomorphometric data in the Shikoku Island are compared with the qualitative evaluation results for the danger of rock fall disasters based on the field surveys. The results of the comparison show that the combinations of geomorphometric data, which are specific to each geologic province, can be used to evaluate the danger of rock fall disasters.

Key words: rock fall disaster, DEM, Kitakami Mountains, Shikoku Island

Impact of Imposed Stresses on Archaeological Remains and their Sediments

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Construction work in urban areas damages archaeological remains. Despite attempts to minimise the effects of site development on both sediments and their inclusions, little work has been done to establish the precise nature of any deterioration to *in-situ* archaeology. It is not yet possible for archaeologist to clearly define and accurately quantify the effect of engineering associated with site disturbance and development on *in-situ* material. The research to be reported in this paper aims to propose changes in policy that will enhance the preservation of *in-situ* archaeology and provide clear guidelines to planning authorities. Investigations have focused on sites in central London, UK, where important remains have been unearthed as part of site development. Soil properties and archaeological features were established through detailed site investigation, past stress regime analysis and basic soil laboratory testing. Ground vibration patterns arising from construction work were recorded in the field and a laboratory geotechnical testing programme was designed based on field data to undertake a sequence of controlled tests where the impact of imposed stresses on artifacts could be monitored. The results from geotechnical tests are presented and the importance of engineering techniques to geomorphology is discussed.

Key words: archaeology, dynamic loading, geotechnics, in-situ, stress-strain

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Repeatedly with an Anthropogenic Triggering Example of the Büyükçekmece Landslides: Çakmaklý Landslide (Istanbul, NW Turkey

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Çakmaklý Landslide is a rotational landslide that occured at the south of the Çakmaklý village. This village bounds to Büyükçekmece district of the Istanbul province in the NW part of Turkey. Aproximately 1 million m^3 materials had begun to act again 2nd /02/2000, on the tributary of the Büyük Fýndýklý Creek which is establihed southern slope. The main reason for occurence of the Landslide is the drinking water pipe-line of the Büyükçekmece Dam site which placed and passed on a landslide susceptible area. During this construction, the slope stability has been disturbed. In this site, the triggering factors are (i) steep slopes of the valley; (ii) heavy seasonal rainfall; (iii) soft and loose formations of Oligocene and Miocene (clay, marl, silt, sand, sandstone, limestone); (iv) wrong human activities, constructions; (v) choosing wrong places of the engineering structure; (vi) leaking the water from the main reservoir water deposits and the drinking water pipe-line landslide area was so many damages at the end of the last landslide. The drinking water pipe-line has been completely destroyed.. Over the one million people was remained one week without drinking water.

Key words: Landslide, Izmit Earthquake 17th /08/1999, M_s=7.4, Çakmaklý, Istanbul