GIS-based mapping of landslide prone areas: A case study at Aetomilitsa, western Hellas

N. Spanou (1), P. Paschos (2) and M. Meidani (3)

(1) Inst. of Geology and Mineral Exploration, Athena, Hellas, (2) Inst. of Geology and Mineral Exploration, Western Hellas Branch, Preveza, Hellas, (3) Dept. of Civil Engineering, School of Engineering, Shiraz Univ., Shiraz, Iran (spanou@igme.gr / Fax: +302107782209 / Phone: +306932855048)

A large part of the central and western Hellenic territory is formed by flysch sediments. The occurrence of a highly sheared and weathered flysch formation of variable lithology, comprising conglomerate, sandstone and shale, together with high relief and heavy precipitation, have led to large landslides in this region. The case discussed is at Aetomilitsa commune in western Hellas. For a better understanding of landslide mechanisms, systematic geological and geotechnical investigations were carried out to obtain the detailed geometry of the slid masses. Comparison between recent and past aerial photographs showed significant changes of the landscape pattern caused by intense erosion. Ten exploration boreholes along the provincial road, and in the urban area, were drilled and a series of laboratory tests were carried out on the obtained samples to identify the physical and mechanical properties of the formation. Ground water table depth and inclinometric measurements were periodically made. By using the obtained tests results, stability analysis was performed for the observed landslides, and safety factors of slope failure were estimated. An alternative model was prepared by considering probable mitigation measures, and their performance verified. Finally, maps of landslide susceptibility and suitability-development were compiled by GIS, classifying the region into suitable, conditionally suitable and totally unsuitable areas for urban development purposes.