



Are soil bioengineering techniques really effective for reducing landslide hazard? Some answers from recent experiences in Campania (Italy)

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In the last years, some Italian regions have adopted specific laws which encompass soil bio-engineering techniques as preferential solutions for the mitigation of geo-hydrological hazards. Campania is one of these regions, having its regional government approved such a law in 2002; following this law, the use of soil bio-engineering techniques has been greatly prompted, also thanks to relevant funds, partly coming from the European Union. In this paper, first results of a regional survey are presented, where the emphasis is placed on the effectiveness of the various soil bio-engineering techniques, when used with the aim of reducing the landslide hazard. As regards slope instabilities, in Campania three main geomorphological units can be recognized, namely: volcanic districts, carbonate Apennine, and sub-Apennine hills. In the volcanic districts (Campi Flegrei and Phlegraean islands, Mt. Somma-Vesuvius, Mt. Roccamonfina), soil slides rarely evolving into debris flows affect loose pyroclastic terrains, while falls and topples detach from volcanic tuffs and lavas. The carbonate Apennine represents the backbone not only of the Campania region, but of the entire central-southern Italy as well. Here, soil slides are again typical of the pyroclastic covers mantling the carbonate bedrock; channelized debris flows are the usual evolution when the initial slides reach the low-order drainage network along the slopes. Rockfalls take place from the high-angle scarps, where carbonate rocks crop out. In the sub-Apennine hills, weathered structurally complex formations prevail in outcrop. Here, complex landslides are common, often represented by roto-translational slides

evolving into earth flows. All these settings have been recently interested by the usage of remedial measures essentially based on soil bio-engineering techniques. However, their distribution over the regional territory is uneven, with the provinces of Avellino and Benevento which host the large majority of the financed projects. Accordingly, our research started from the province of Avellino, where about 60 cases have been surveyed and monitored over the 2003-2005 period, with the scope of verifying the “rate of success” of the bio-engineering techniques in the field of landslide hazard mitigation. With reference to the case-studies considered, the situation presents shadows and lights, since only very few mass movements seem to have received real benefits from the adoption of the “green measures”. Some final comments on this evidence are spent, aimed at finding possible improving options.