Introduction

In October 2012 the Italian Ministry of Education, University and Research (MIUR), within the Projects of Relevant National Interest (PRIN) 2010-2011, co-funded the research project on "Landslide risk mitigation through sustainable countermeasures" involving nine Research Units (University of Salerno, as scientific coordinator; Polytechnic University of Milan; University of Naples "Parthenope"; Polytechnic University of Turin; University of Perugia; "Mediterranea" University of Reggio Calabria; University of Basilicata; University of Genoa; University of Palermo). According to the Objective 1 of the Technical Committee TC307 of the ISSMGE on the "Sustainability in Geotechnical Engineering" [Basu *et al.*, 2015; Basu and Puppala, 2015] and on the basis of the framework for landslide risk management provided by Fell *et al.* [2008], the main goal of the research project consisted in identifying the most suitable strategies for mitigating the landslide risk to which people, facilities, economic activities and environmental assets are exposed.

Focusing on the *sustainability of the landslide risk mitigation measure*s to be designed at slope scale Ferlisi *et al.*, [2014], this issue integrates the issue 3/2017 of the Rivista Italiana di Geotecnica (RIG) and includes three papers.

In particular, the paper authored by Valore *et al.* [2018] focuses on the design of deep trenches – aimed at either stabilizing existing landslides or improving the stability conditions of marginally stable slopes – by using a pervious concrete. In this regard, the results of laboratory tests highlight that a proper mix-design allows fulfilling some relevant requirement dealing with permeability, filter and durability of the pervious concrete, and the strength demand as well. Accordingly, some instability problems – which might derive from the use of unbonded materials in the construction stages of deep trenches by way of secant piles or adjacent vertical panels based on methods well-established for diaphragm walls – can be overcome.

The paper authored by Cuomo [2018] presents the results of a study aimed at evaluating the performance and limitations of a physically-based model, at both laboratory and catchment scales, to properly reproduce rainfall-induced slope instabilities involving unsaturated air-fall soils. A particular attention is devoted to runoff and superficial erosion processes, which are quantified in terms of total peak discharge and volume of eroded sediments, in originating (and differentiating) the above slope instabilities. In this regard, the addressed topic offers new perspectives for the geotechnical engineers since the estimation of the above parameters is a prerequisite for optimizing the design of protection works.

The paper authored by Bovolenta *et al.* [2018] deals with the use of soil bioengineering techniques in decision-making processes aimed at mitigating the landslide risk. In this regard, after a brief overview of the most common soil bioengineering practices, the results of experiments on either plant roots or rooted soil samples are firstly presented and discussed. Then, the contribution offered by plants in progressively enhance the performance of crib walls is shown according to the factor of safety approach. From this point of view, the bioengineering represents a new challenge for geotechnical engineers involved in the design of prevention (or stabilization) works which requires a deep knowledge of the slope-atmosphere interaction processes.

As coordinators of the PRIN research project, we thank the Authors of the papers for the excellent work done and the Editorial Board of RIG that promoted this issue (along with the previous one published on 2017) for a proper dissemination of some relevant outcomes of the project. In this regard, we believe that the Geotechnical Community is ready to take up the incoming challenges posed by the *sustainability of the landslide risk management system* within a strategic perspective to be

developed at national, regional and municipal level for properly identifying the areas where landslide risk mitigation measures are required, as widely discussed by CASCINI [2014; 2015] and CASCINI *et al.* [2018].

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