An interdisciplinary approach to landslide damage assessment in urban areas

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Abstract

This paper presents some results of a multidisciplinary research about the assessment of damages to ordinary buildings at the urban scale in landslide areas. The methodology represents part of a multi-level approach for landslide vulnerability assessment that has been recently developed. It is based on rapid visual inspections of the buildings, the application of 'simple models' to interpret the structural response, the geological and geotechnical knowledge of the site. The end-product is the landslide damage geotechnical chart, including: i) the damage grade of the buildings, ii) the geomorphological and geotechnical map of the area, iii) the direction of the settlements causing damages. The application of the methodology to an historical site in southern Italy is also outlined. Finally, the contribution of innovative non-invasive spaceborne remote sensing techniques to monitor landslide-affected urban areas is highlighted.

Keywords: damage assessment; R.C. buildings; masonry buildings; landslides; load path method; geomorphological and geotechnical characterisation; structural assessment; landslide risk assessment; DInSAR.

1 Introduction

Landslide risk is commonly a research topic of interest across the scientific community mainly involving geologists, geomorphologists and geotechnical engineers. However, if the diagnosis of the geo-hydro-mechanical processes bringing about landsliding is the fundamental step for the hazard assessment ([1]-[3]), the vulnerability assessment of the buildings interacting with slopes has to be also developed. This is a key aspect to both relate the occurrence of the landslide mechanisms to the damages that the event would bring about and assess the associated risk. It follows that the research on landslide risk assessment, when dealing with urbanised slopes,

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