

Time-Space prediction of high impact landslides under changing precipitation regimes.

In Italy a significant increase of landslide frequency and intensity in the last decades has been occurred, whose impact must be evaluated with respect to the convergence in possible negative effects of both rainfall regime changes and of urban development as well as land use changes. Italy, due to its geomorphological and urbanization characters, represents today one of the countries where landslide risk is at the highest level. Such characters urge researchers and Planning Authorities to reconsider also recent landslide prediction studies and Landslide Risk Master Plans.

Besides, the research in this field is considerable increased, thanks to new data acquisition and to new models available, further on indicating that a careful re-examination of the landslide risk in Italy is needed.

This project teams up many of the main Italian experts of landslide analysis and modeling and represents an important condition for data and knowledge exchange, as well as a favorable one towards achievement of the general objectives of the project, which can be summarized as: 1) finalization of innovative methods towards understanding of the triggering and propagation phenomena of landslides, as related to pore pressures evolution within (potentially) unstable slope materials; 2) evaluation of the role of the changes in precipitation trends upon recent and future landslide occurrence; 3) definition of procedures aimed at the assessment of landslide susceptibility and hazard, as related to the main, different, Italian geological and evolutionary backgrounds.

Achievement of such objectives shall permit effective knowledge, methods, and data transfer towards the Italian territorial government (Basin Authorities, Environmental protection agencies; National and local Civil Protection), among other planning and regulatory activities, to landslide risk assessments. These objectives are completely consistent with the finality of Program EC Horizon 2020, and in particular with the part "Societal challenges", which promotes actions aimed at protecting EU citizens and international partners from a variety of threats, including man-made and natural disasters.

The proposed study will be carry out by integration of eight Research Unit (RU), each one belong to a university department or to National Council of the Research (CNR) and are: the University of Sannio (UR-UNISANNIO), which will coordinate the Project; the University of

Florence (UR-UNIFI); the University of Milano-Bicocca (UR-UNIMIB); the University of Bologna (UR-UNIBO); the University of Chieti (UR-UNICH); the University of Naples (UR-UNINA); the Technical University of Bari (UR-POLIBA); the Institute for Geo-Hydrological Hazards Assessment of CNR – Perugia (UR-IRPI). The Research Units have a long experience in studies of landslides in Alps and Apennines context, in landslide monitoring systems development, in the geotechnical characterization of materials and in the modelling of triggering and propagation conditions.

For the achievement of the proposed objectives the project has been structured into 7 WP (Work Packages): WP1 - Project Management; WP2 - Landslides characterization and physic model definition; WP3 - Analysis and modelling of triggering conditions; WP4 – Landslide spatial prediction; WP5 – Temporal forecast and simulation of rainfall regime changes; WP6 – Improvement and definition of hazard and risk scenario, Alarm systems; WP7 – Dissemination. Each Work Package will under responsibility of one or two Research Unit and will be articulated in specific themes developed by one or several Research Unit.

