

LANDSLIDE HAZARDS AND RISK ASSESSMENT: OVERVIEW AND PROSPECTS

Fausto Guzzetti

Consiglio Nazionale delle Ricerche, Istituto di Ricerca per la Protezione
Idrogeologica, Perugia, Italy.

F.Guzzetti@irpi.cnr.it

Landslides are triggered by many different causes including intense or prolonged rainfall. The volume of single slope failures spans 10 orders of magnitude, from a boulder falling off a rock cliff to sub-marine slides involving several cubic kilometres of rock. Landslide velocity extends over 14 orders of magnitude, from millimetres per year to hundreds of kilometres per hour. Mass movements occur singularly or in several thousands, and diffused landsliding is most commonly rainfall or earthquake induced. The large spectrum of landslide phenomena makes it difficult to define a single methodology (a standard) to evaluate landslide hazards and risk. Impact of mass-movements can be tremendous, particularly in the Mediterranean area. Landslides cause casualties and damage every year, locally resulting in extensive economic losses. For this reason, the recognition and mapping of landslide areas, the assessment of landslide hazards, and the evaluation of landslide risk have become priorities for both scientists and decision makers. In Italy, a turning point in landslide hazards and risk assessment took place after the landslide disaster on 5-6 May 1998, at Sarno and Quindici (Campania Region), when secondary lahars detached from the slopes of Pizzo d'Alvano killed 153 people. The Sarno landslide disaster produced a tremendous impact nationwide, which included unprecedented coverage by the mass media, and prompted a new legislation on landslide risk-assessment procedures. In the framework of this new legislation the Italian Regional Governments and the National River Basin Authorities have completed an inventory of sites where landslide risk is considered to be particularly severe. In the talk, after a brief introduction on the impact of mass movements in Italy, with examples of catastrophic failures, I present a geomorphological methodology, developed at CNR-IRPI, to evaluate landslide hazard and risk in urban and rural areas. The method is based on the recognition of existing and past landslides, on the scrutiny of the local geological and morphological setting, and on the study of site-specific and historical information on past landslide events. General considerations of the lessons learned in 15 years of landslide cartography and of landslide hazard and risk assessment at CNR-IRPI will also be briefly discussed.