Ten years of civil protection support activities in landslide areas of Basilicata

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In the last decade, the Italian territory has been severely damaged by the occurrence of hydrogeological instability phenomena with a growing impact on human activities and the economy. More and more often the phenomena have involved urban areas with considerable effects on the population that was forced to leave home for safety reasons. Furthermore, damage to the infrastructures have worsened the living conditions isolating the population for many days.

In the latest ISPRA technical report of 2018 (http://www.isprambiente.gov.it/it/pubblicazioni/rapporoti/dissesto-idrogeologico-in-italia-pericolosita-e-indicatori-di-rischio-edizione-2018), which analyses the spatial distribution of landslides throughout Italian regions, great attention was paid to the impact of landslides on the urban fabric. According to this report, there are 83 towns out of 131 (63%) in Basilicata region where the landslides involve the continuous and discontinuous urban fabric as well as industrial or commercial areas. This high percentage is especially due to the geological settings, the type of human settlements characterizing the region and, especially during the last years, to the occurrence of intense rainfall events. Indeed, starting from December 2013 when as a consequence of intense rainfall events a fast landslide affected the southwest area of Montescaglioso town in the Matera hill, other important and dangerous phenomena have affected the Basilicata territory. Among these the Stiglano (MT) and the Pomarico (MT) phenomena, respectively occurred in February 2014 and in January 2019, are worth mentioning. All these landslides have caused significant damage to road infrastructures, civil structures and commercial activities, requiring the proclamation of a state of emergency, the evacuation of some houses and the intervention of Italian National Civil Protection. From a logistically point of view the study of landslides occurring in urban areas can be more complicated than in the rural areas. The presence of structures and infrastructures involved in the land movement, also posing risk and safety issues for personnel, can make detailed investigations difficult. The adoption of an integrated approach based on the combined application of different non-invasive in situ investigation techniques would, in most cases, help to overcome such limitations, to increase the number of information and to reduce the specific drawbacks of each technique such as, for example, the deterioration of data quality due to the high noise level. A successful geophysical application where results are well integrated and compared with direct information can help to correctly reconstruct the geological model of the subsoil. The geophysical model can indeed provide information on the geological setting of the area, helping to answer the most frequent questions of civil protection technicians such as: how deep is the sliding surface? how much material was involved in the movement? are there any areas that could be affected by instability phenomena?