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A model for assessing the systemic vulnerability landslide prone areas

S. Pascale[1], F. Sdao[2], and A. Sole[1]

[1]Department of Environmental Engineering and Physics, University of Bas
Potenza, Italy
[2]Department of Structures, Geotechnics, Engineering Geology, University
Basilicata, Potenza, Italy

Abstract. The objectives of spatial planning should include the defi
and assessment of possible mitigation strategies regarding the eff
natural hazards on the surrounding territory. Unfortunately, howev
there is often a lack of adequate tools to provide necessary suppo
local bodies responsible for land management. This paper deals wi
conception, the development and the validation of an integrated nu
model for assessing systemic vulnerability in complex and urbaniz
landslide-prone areas. The proposed model considers this vulnerab
as a characteristic of a particular element at risk, but as a peculiari
complex territorial system, in which the elements are reciprocally li
functional way. It is an index of the tendency of a given territorial e
to suffer damage (usually of a functional kind) due to its interconne
with other elements of the same territorial system. The innovative
of this work also lies in the formalization of a procedure based on a
network of influences for an adequate assessment of such "system
vulnerability.

This approach can be used to obtain information which is useful, in
given situation of a territory hit by a landslide event, for the identifi
of the element which has suffered the most functional damage, ie
"critical" element and the element which has the greatest repercus
other elements of the system and thus a "decisive" role in the
management of the emergency.

This model was developed within a GIS system through the followi
phases:

1. the topological characterization of the territorial system studied
assessment of the scenarios in terms of spatial landslide hazard. A
statistical method, based on neural networks was proposed for th
assessment of landslide hazard;

2. the analysis of the direct consequences of a scenario event on t
system;

3. the definition of the assessment model of systemic vulnerability

landslide-prone areas.

To highlight the potentialities of the proposed approach we have c
a specific case study of landslide hazard in the local council area of
Potenza.

Full Article (PDF, 2222 KB)

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