The neural network applied to spatial hazard of the landslide dam making

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Some tectonic areas, subjected to shocks, volcanic or tectonic events, having a bedrock stressed, jointed or hydrothermally altered, have got a great predisposition to landslide (Costa e Schuster, 1999).These mass movements in some cases block the stream river, easily in the steepest valleys rounded by high reliefs, causing the lake making upstream. The term "landslide dam" is defined as the blockage of a river occurred for natural causes and induced from mass movements. The landslide dams constitute an hazard upstream and downstream to the blockage for several causes as the flooding following the failure of the dam or for the reservoir filling. The literature until now assessed the landslide dams stability using geomorphic index based on empirical approaches and on a mere graphical nature. The aim of this study is to define the geomorphic and structural parameters that condition landslide dams making and to individuate a statistical model that best fit a spatial geomorphic hazard forecast. The landslide dams susceptibility was assessed by an innovative technique based on the artificial intelligence method: the Artificial Neural Network (having less subjectivity). This methodology allows to draw maps of susceptibility of the study area starting from thematic maps representing the parameters responsible of the predisposition of the territory to make landslide dams. We considered same parameters like: the natural dam lithology as the difference between matrix and grain-supported, the tendency of territory to landslide making, the hydraulic risk linked to flooding areas along the river and a ratio between the landslide velocity and the width of channel blocked, the entrenchment. The proposed model has been applied with good results to some cases selected from hydrogeological basins of the Appennines in Basilicata