



Comparative Analysis of Human Vulnerability to floods and landslides in Southern Italy: A Multi-Decadal Study

Graziella Emanuela Scarcella, Giovanni Cosentini, Enzo Valente, and **Olga Petrucci**

CNR-IRPI Research Institute for Geo-Hydrological Protection, Italy (graziellascarcella90@gmail.com)

Severe storms can cause territorial crisis encompassing the occurrence of phenomena such as floods and landslides (F&L), resulting in significant damage to human life and property. While existing literature often separately analyzes floods and landslides due to their distinct mechanisms, forecasting methods, and preventive measures, there is a growing recognition of the need for a multi-hazard approach to enhance risk management planning. Particularly prevalent in regions with susceptible geomorphological features and specific climatic conditions, such as the Mediterranean, F&L pose substantial threats, further exacerbated by projected climate change impacts. This study focuses on the region of Calabria, Southern Italy, prone to frequent occurrences of F&L, aiming to assess the evolving impacts of these events on the population over time. We started the research by hypothesizing that shifts in societies, land use, policies, and population habits may change F&L impact on individuals over the years, either increasing or decreasing.

Utilizing systematic analysis of regional newspapers and historical archives spanning two decades (1951-1960 and 2011-2020), we constructed a database categorizing the impact of F&L into three severity levels: fatalities, injuries, and involvement in F&L related incidents. Narratives of events were disaggregated to describe victim profiles and accident circumstances. Despite variations in data availability and reliability between the two study periods, our analysis revealed insights into human vulnerability to F&L and emphasized the importance of systematic data collection for informed risk reduction strategies.

Comparing the two periods, we found a significant decrease in fatalities between 1951-1960 (around 200 in 10 years) and 2011-2020 (around 20 in 10 years), accompanied by increased information on injuries and individuals involved in F&L events in the latter period. This result underscores potential shifts in societal dynamics, land use, policies, and population habits impacting people vulnerability to F&L.

Our study proposes a methodological approach, applicable to other Mediterranean or non-Mediterranean regions, to identify vulnerabilities in interactions between people and F&L during severe rainfall events. By focusing on people's behavior and its evolution over time, this approach provides valuable insights for planning customized informative campaigns aimed at enhancing awareness and improving precautionary behaviors and self-rescue strategies in flood and landslide scenarios.

***This work was funded by the Next Generation EU—Italian NRRP, Mission 4, Component 2, Investment 1.5, call for the creation and strengthening of 'Innovation Ecosystems', building 'Territorial R&D Leaders' (Directorial Decree n. 2021/3277)—project Tech4You—Technologies for climate change adaptation and quality of life improvement, n. ECS0000009. This work reflects only the authors' views and opinions, neither the Ministry for University and Research nor the European Commission can be considered responsible for them.

