Spatial and temporal patterns and socioeconomic impact of landslides in Colombia

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Landslide is a natural hazard that constitutes a major threat to human life and infrastructure in many parts of the world, especially in tropical and mountainous countries such as Colombia. Although economic losses tend to be concentrated in industrialized and developed countries, human fatalities and affected persons are most severe in densely populated less developed countries. Although landslide is a very common phenomenon in Colombia, no studies have presented a national and comprehensive spatial, temporal and socioeconomic analysis of landslides based on historical records. This paper presents a detailed analysis of spatial and temporal trend of landslide occurrence in Colombia from 1900 to 2016, and the socioeconomic losses associated. Two national landslide databases were compiled: Disaster Inventory System (DesInventar) and Landslide Information System (SIMMA), corroborated and complemented with regional and local landslide catalogues from Government offices, and aid agencies reports. A significantly increased database of fatalities and economic loss from landslides has been created during this process. A total of 32.022 landslides were compiled in the 116-year period, including earthquake, volcanic and rainfall – landslides triggered. Rainfall is the most common triggering factor with 92% of landslide registers with landslide triggering cause, but fatalities are concentrated in landslides triggered by volcanic activity or earthquakes with 66% of the total fatalities. Colombia shows a very high acceptability of risk, from 1970 to 2015 the mean annual number of landslides in Colombia with at least one fatality is 47. The results permit to have the best possible knowledge about the landslide occurrence and damages in Colombia.
Keywords: Landslides, Rainfall, Colombia, fatalities and economic losses.