

Volcanic risk assessment in Chilean districts: A Social Vulnerability index application and multi-criteria analysis approach

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Key words:

There are around 90 geologically active volcanoes in Chilean mainland territory, mostly located in the Central and Southern Andes main mountain range. Population density is highly concentrated in urban areas of the Central Valley as the capital city of Santiago (~5.5 millions of inhabitants) and coastal areas such as Concepción or Valparaíso (~1million of inhabitants each one). In this geographic context, volcanic hazard zones are located in extended rural areas with a low population density, but composed primarily of humble farmer families with a limited resilience capacity. Volcanic hazard areas also have critical national infrastructure as power plants and energy transmission lines, international and interregional roads, airports and aerodromes and other relevant infrastructure that may be affected by volcanic processes in a regional or local scale such as educational facilities (used as shelters during volcanic crisis) and hospitals. The aim of this study is to assess the volcanic risk of Chilean districts through a social vulnerability index application (SoVI Chile) combining 23 census variables (Census 2002) and then a multi-criteria analysis that combines information of volcanic hazards (proximal and distal), social data (SoVI Chile) and critical infrastructure of each district (hospitals, roads, schools, airports, transmission lines, urban areas, protected areas and power stations). These results provide a general overview of the volcanic risk situation in Chile and highlight the priority areas in order to improve the population preparedness and governmental contingency plans.