Reconstruction of Chaitén town, southern Chile, in a high-hazard zone. What we can do from the geological perspective?

Álvaro Amigo[1], Gonzalo Hermosilla[1], Daniel Bertin[1]

[1]Servicio Nacional de Geología y Minería SERNAGEOMIN, Chile.

Key words: Southern Volcanic Zone, Hazard maps, Explosive activity, Northern Patagonia

Chaitén volcano erupted explosively in May 2008, generating substantial ash fall in southern Chile and Argentina and the occurrence several pyroclastic density currents on the northern and northeastern flanks of the volcano. As a consequence of the rapid hazard assessments done by SERNAGEOMIN, national authorities decided within days to a full evacuation of the residents near the volcano. Few days after, flooding and sediment transport related to the erosion and transport by rainfall of the new deposited material severely damage the Chaitén town. As explosive activity waned a new lava-dome was started to be emplaced within the volcano's caldera. After months of extrusion at high effusion rates, part of the dome collapsed generating a block-and-ash flow toward the town. The eruption finished at the beginning of 2010.

Despite Chaitén town was located no more than 10 km from the volcano, local inhabitants did not know they were living near such active volcano. Neither historical accounts of eruptions nor the post-glacial history of the volcano were known prior to 2008. Attempts of moving the town some kilometers north to a much safer zone were not successful and since 2010 the town has been rebuilding in the same place where it was located before.

Since the eruption of Chaitén, SERNAGEOMIN created the National Network for Volcanic Surveillance, which is monitoring the most active volcanoes in the country. Along with the network set up, geological studies have been done in order to develop geological studies and the publication of volcano hazard maps. In the next months a new volcano hazard map will be published for Chaitén volcano.

The geological studies done suggest that the volcano is much more active than previously thought, and even the 2008-2009 eruption is small in magnitude compared to the record of Holocene events. Therefore the impacts of future activity can directly impact the town.

The goal of this study is helping in the establishment of guiding planning for post-disaster reconstruction and an effective communication of the monitoring status and the geology of the volcano oriented to both decision-makers and local residents.