



# Under the Volcanoes

**Benjamin Hennig charts the impact of volcanoes on nearby human populations**

**N**atural events usually turn into 'natural disasters' when they happen in more densely populated areas. Recent volcanic eruptions, ranging from Mount Agung on Bali in November 2017 to Kilauea on Hawaii and Fuego in Guatemala in 2018, have been making the headlines not only for their visual spectacle, but for threatening people's lives in various ways.

The destructive forces of volcanoes have not prevented people from settling nearby. Volcanic ashes and lava have valuable effects on soil fertility with

nutrients offering good conditions for agriculture, especially in warmer climates where weathering helps soils to further develop. Volcanic areas are mineral rich and therefore often provide ideal mining conditions. Active zones also provide a good basis for exploiting geothermal energy available close to the surface. They have become an important element for developing tourism in regions that feature volcanic landscapes. These positive effects have led to some of the most active volcanic regions being densely populated. Volcanoes are an element of nature that provide and threaten people's livelihoods at the same time.

The exact number of active volcanoes on Earth is uncertain. The United States Geological Survey

estimates there are approximately 1,500, in addition to the continuous belt of volcanoes on the sea floor. More than half a billion of the world's population lives in a distance of 100km or less to one (or several) volcanoes, mostly in regions around the Pacific 'ring of fire'.

The cartogram above visualises the human populations that live within proximity of the world's active volcanoes. It shows a 100km radius drawn around each volcano (see small reference map) which is then resized proportional to the number of people living there. Volcanoes in the sea areas retain their original radius as their populations (if there are any) are mostly too small to be visible.

The cartogram highlights the above-mentioned regions in large parts of Central America, Japan and Southeast Asia. Here, large populations are within hazardous areas that have a high potential of being affected by an eruption. Major volcanic areas in the vicinity of larger agglomerations around the world include the Taal Volcano on the island of Luzon in the Philippines (24.8 million people within a 100km radius), Coatepeque Caldera in El Salvador (6.5 million), the Corbetti Caldera in Ethiopia (9.8

million), and Vesuvius in Italy (six million).

A 2001 analysis of the global distribution of human population and recent volcanism by Columbia University came to the conclusion that the 'current trends of rapid urbanisation and sustained population growth in tropical developing countries, combined with agricultural intensification of fertile volcanic terrains could alter the relationship between humans and volcanoes so as to increase both local and global consequences of volcanic eruptions in the future.'

This map shows how this risky relationship has intensified over the past two decades through an ongoing population growth in the neighbourhoods of some of the most hazardous volcanoes. While they remain a friend and foe of the people living under their shadows, preparedness is key to mitigating their damages when they erupt. ●

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