

Carbon Dioxide Emissions by Himalayan Geothermal Springs

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The Himalayas host hundreds of geothermal springs and they release a huge amount of carbon dioxide in the atmosphere, according to a study by the scientists of the Wadia Institute of Himalayan Geology (WIHG). The scientists at the **WIHG, a Dehradun-based institute under the Department of Science and Technology**, studied geothermal springs which cover about 10,000 square kms in the Garhwal region of the Himalayas in Uttarakhand.

C02 Emissions by Geothermal Springs

Carbon outflux from Earth's interior to the exosphere through volcanic eruptions, fault zones, and geothermal systems contribute to the global carbon cycle that affects short and long term climate of the Earth. Himalaya hosts about 600 geothermal springs having varied temperature and chemical conditions. Their role in regional and global climate, as well as the process of tectonic driven gas emission, needs to be considered while estimating emissions to the carbon cycle and thereby to global warming. The **Himalayan geothermal springs which cover about 10,000 square km in the Garhwal region of Himalaya**, show a significant discharge of Carbon dioxide(C02) rich water.

The study published in the scientific journal Environmental Science and Pollution Research suggested that C02 in these thermal springs are **sourced from metamorphic decarbonation of carbonate rocks present deep in the Himalayan core along with magmatism and oxidation of graphite.** Most of the geothermal water is dominated by evaporation followed by weathering of silicate rocks. **Isotopic analyses further point towards a meteoric source for geothermal water.**

The team of scientists carried out detailed chemical and stable isotope analysis of water samples collected from 20 geothermal springs from major fault zones of Garhwal Himalaya. **Isotopic measurements (identification of the abundance of certain stable isotopes and chemical elements within organic and inorganic compounds) such as Dissolved Inorganic Carbon, and Oxygen** along with major ions were analysed for all the samples. They found that the geothermal spring water contains high Dissolved Inorganic Carbon. Further, a high concentration of Cl^- and Na^+ in geothermal spring waters indicated its deeper source.