

BACKGROUND RADIATION HIGH IN KERALA, BUT NO RISK, SAYS STUDY

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The Indian Rare Earths mining area at Vellanathu Thuruth in Kollam. File | Photo Credit: C. Sureshkumar

In parts of Kerala, background radiation levels, or that emitted from natural sources such as rocks, sand or mountains, are nearly three times more than what's been assumed, a pan-India study by scientists at the Bhabha Atomic Research Centre (BARC) has found. This doesn't however translate to an elevated health risk.

Radiation results from the disintegrating nucleus of an unstable element and these can be from anywhere, including from inside our bodies to the constituents of matter. Gamma rays are a kind of radiation that can pass unobstructed through matter. Though extremely energetic, they are harmless unless present in large concentrated doses. It's similar to heat from a fire feeling pleasant until a sustained, concentrated burst can scald or worse, ignite.

Especially around nuclear plants, gamma radiation levels are monitored as also the average quantity of radiation that plant workers are exposed to. The International Atomic Energy Agency (IAEA) specifies maximum radiation exposure levels and this has also been adopted by India's atomic energy establishment. Public exposure shouldn't exceed 1 milli-Sievert every year, those who work in plants or are by virtue of their occupation shouldn't be exposed to over 30 milli-Sievert every year.

The present study found that average natural background levels of gamma radiation in India was 94 nGy/hr (nano Gray per hour) (or roughly 0.8 milli sievert/year). The last such study, conducted in 1986, computed such radiation to be 89 nGy/hr. 1 Gray is equivalent to 1 Sievert, though one unit refers to radiation emitted and the other to biological exposure.

However, the 1986 study measured the highest radiation exposure at Chavara, Kerala at 3,002 nGy/year. The present study found that the levels in Kollam district (where Chavara is situated) were 9,562 nGy/hr, or about three times more. This computes to about 70 milliGray a year, or a little more than what a worker in a nuclear plant is exposed to. "This doesn't mean that those at Kollam are being exposed to higher, dangerous levels of radiation. There have been extensive studies in the past that have checked for higher rates of cancer or mortality and nothing out of the ordinary has been found," Dinesh Aswal, senior scientist at the BARC and among the

authors of the study, told *The Hindu*. "This only shows that the body is accustomed to higher doses of radiation. The limits set by the IAEA are extremely conservative and only reflect abundant caution."

The higher radiation levels in Kollam are attributed to monazite sands that are high in thorium, and this for many years, is part of India's long-term plan to sustainably produce nuclear fuel. Southern India, because of the presence of granite and basaltic, volcanic rock has higher levels of radiation from uranium deposits.

"We have found a slightly fair correlation between soil classes and absorbed dose rate. Low values (around 67 nGy/h) of absorbed dose rate in air were recorded for mixed red and black soils of Maharashtra and Gujarat while high values of (around 170 nGy/h) were recorded in the west-coastal plains of Kerala containing coastal and derived deltaic alluvial soils," the authors note in the study, which is published this month in the peer-reviewed *Journal of Environmental Radioactivity*.

India's plans to increase reliance on nuclear energy meant that it was time to update estimates on the natural background radiation, Dr. Aswal said.

The current study measured radiation levels from nearly 100,000 locations across the country as opposed to the 1986 survey that only mapped 214 locations.

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