

## MILLIONS IN INDIA MAY FACE NUTRITIONAL DEFICIENCIES DUE TO CO<sub>2</sub> RISE: STUDY

Relevant for: Environment & Disaster Management | Topic: Environmental Degradation - GHGs, Ozone Depletion & Climate Change

Concentrations of protein, iron, and zinc were lower in crops grown in environments with high carbon dioxide concentrations | Photo Credit: [M. Srinath](#)

Millions of Indians are at the risk of becoming nutrient deficient by 2050, as rising levels of carbon dioxide (CO<sub>2</sub>) are making staple crops such as rice and wheat less nutritious, according to a study.

Researchers at Harvard T.H. Chan School of Public Health in the US found that rising CO<sub>2</sub> levels from human activity could result in 175 million people worldwide becoming zinc deficient and 122 million people becoming protein deficient by 2050.

The study, published in the journal *Nature Climate Change*, also found that over one billion women and children could lose a large amount of their dietary iron intake, putting them at increased risk of anaemia and other diseases.

It found that India would bear the greatest burden, with an estimated 50 million people becoming zinc deficient. As many as 38 million people in India are at the risk of becoming protein deficient, and 502 million women and children becoming vulnerable to diseases associated with iron deficiency, the researchers said.

Other countries in South Asia, Southeast Asia, Africa, and the Middle East would also be significantly impacted, they said.

“Our research makes it clear that decisions we are making every day — how we heat our homes, what we eat, how we move around, what we choose to purchase — are making our food less nutritious and imperiling the health of other populations and future generations,” said Sam Myers, principal research scientist at Harvard Chan School.

Presently, over two billion people worldwide are estimated to be deficient in one or more nutrients. In general, humans tend to get a majority of key nutrients from plants: 63 % of dietary protein, 81 % of iron and 68 % of zinc comes from vegetal sources, researchers said.

It has been shown that higher atmospheric levels of CO<sub>2</sub> result in less nutritious crop yields, researchers said.

Concentrations of protein, iron, and zinc are 3-17 % lower when crops are grown in environments where CO<sub>2</sub> concentrations are 550 parts per million (ppm) compared with crops grown under current atmospheric conditions, in which CO<sub>2</sub> levels are just above 400 ppm. Researchers sought to develop the most robust and accurate analysis of the global health burden of CO<sub>2</sub>-related nutrient shifts in crops in 151 countries.

They created a unified set of assumptions across all nutrients and used more detailed age- and sex-specific food supply datasets to improve estimates of the impacts across 225 different foods.

The study showed that by 2050, when atmospheric CO<sub>2</sub> concentrations are expected to reach around 550 ppm, 1.9 % of the global population — or roughly 175 million people, based on 2050 population estimates — could become deficient in zinc. About 1.3 % of the global population, or 122 million people, could become protein deficient, researchers said. Additionally, 1.4 billion women of childbearing age and children under five who are currently at high risk of iron deficiency could have their dietary iron intakes reduced by four percent or more.

The researchers also emphasised that billions of people currently living with nutritional deficiencies would likely see their conditions worsen as a result of less nutritious crops. “We cannot disrupt most of the biophysical conditions to which we have adapted over millions of years without unanticipated impacts on our own health and wellbeing,” Myers said.

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