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Rising Carbon Dioxide Levels & Zinc Deficiency

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Rising carbon dioxide levels can accelerate zinc deficiency in crops and thus in human consumption, according to a new study titled '**Inadequate zinc intake in India: Past, Present and Future**' by the Harvard T.H. Chan School of Public Health.

- Food crops such as wheat, rice, barley, soya, and field peas, which serve as an important source of dietary zinc for billions of people around the world, have recently been **shown to contain lower concentrations of zinc** and other nutrients when grown under open field conditions.
- The study states that inadequate zinc intake has been rising in India for decades, causing tens of millions of people to become newly deficient in it.
 - The **highest rate of inadequate zinc intake** was concentrated mainly in the **southern and northeastern States** with rice-dominated diets: **Kerala, Tamil Nadu, Andhra Pradesh, Manipur and Meghalaya.**
 - The national rates of inadequate zinc intake has **increased from 17% to 25% between 1983 and 2012.**
 - Rising carbon dioxide levels in the coming decades **could accelerate this trend.**
- Apart from **rising CO₂ emissions**, changing diets and an **aging population** are also seen as factors responsible for increasing zinc deficiency.

Overall urban populations, and wealthier urban groups in particular, showed higher rates of inadequate intake as well, due to a **higher proportion of nutrient-poor fats and sugars in the diet.**

Zinc Deficiency

- Zinc supports cell function, helping an estimated 100 enzymes perform their duties. It plays additional roles in the body, including:
 - boosting immune function,
 - helping cells divide,
 - maintaining the sense of smell and taste,
 - promoting wound healing,
 - Zinc also supports a person's growth and development. As such, it is an essential mineral for pregnant women as well as growing children.
- Human body **does not store zinc**, which means getting enough of the mineral from food is important in preventing a deficiency.
- Inadequate zinc intake can have **serious health consequences**, particularly for young children, who are more susceptible to contracting malaria, diarrhoeal diseases and pneumonia, when suffering from zinc deficiency.

The presence of zinc plays a critical role in **human immune systems**.
- **National grain fortification programmes, increased dietary diversity, bio-fortified crops, and reduced carbon dioxide emissions** could make a difference to slow or reverse the course.

Food fortification

- Food fortification refers to the process of **adding essential micronutrients**, such as vitamins and minerals, to food staples to make them more nutritious.
- Food fortification is an effective strategy to meet the nutritional needs of a large number of people across various sections of the society, including the poor and underprivileged as well as the vulnerable, such as pregnant women and young children.
- Common micronutrients deficient in **Indian diets are iron, iodine, vitamin A, folic acid, vitamin B12 and vitamin D**.
- **Fortification of Vanaspati with Vitamin A and D started more than 50 years ago** and has been **mandatory** in the country **since 1953**.
- The **tremendous success of salt iodization programme** signifies the potential of food fortification.

Salt iodization in India started with the **National Goiter Control Programme in 1962**. It gained momentum in 1980s and mandated the distribution of iodized salt in 1997. **Voluntary wheat flour fortification** were notified in 1970s.
- **Article 47 of the Constitution** documents that it is duty of the state to raise the level of nutrition and the standard of living and to improve public health.