



World Soil Day 2023

For Prelims: [World Soil Day](#), [Improving Soil Health](#), [Food and Agriculture Organization \(FAO\)](#), [United Nations](#), International Union of Soil Sciences (IUSS).

For Mains: World Soil Day, Environmental pollution and degradation, Soil Conservation.

Source: HT

Why in News?

Every year, the [United Nations](#) celebrates 5th December as [World Soil Day](#).

- In August 2023, a study by US and Australian researchers in Scientific Reports explored the connection between soil micronutrient levels and the nutritional well-being of individuals in India.

What is World Soil Day (WSD)?

- WSD is celebrated to commemorate the birthday of the late King of Thailand Bhumibol Adulyadej for his lifelong commitment to raising awareness of the importance of sustainable soil management and rehabilitation for food security, poverty alleviation and more.
- WSD was recommended by the **International Union of Soil Sciences (IUSS)** in 2002.
- The [Food and Agriculture Organization \(FAO\)](#) has supported the formal establishment of WSD as a global awareness-raising platform under the leadership of the Kingdom of Thailand within the framework of the Global Soil Partnership.
- 5th December 2014 was designated as the first official **WSD by the UN General Assembly (UNGA)**.
- **Theme 2023:** Soil and Water, a Source of Life.

What is the Link between Soil Micronutrients and the Nutritional Status of Individuals as per the Study?

- **Soil Composition and Micronutrient Absorption:**
 - Soil composition **directly influences the levels of essential micronutrients like zinc and iron** in crops. Plants absorb these nutrients from the soil, and their availability in the soil affects the micronutrient content in food.
- **Impact on Human Health:**
 - Low soil zinc levels have been **linked to higher rates of stunting and underweight conditions in children**. Zinc plays a vital role in growth and immune system function.
 - Soil iron availability correlates with the prevalence of anemia. Iron is crucial for hemoglobin production, necessary for oxygen transport in the body.
 - In regions where soil lacks adequate zinc, iron, and other essential micronutrients, there's a higher likelihood of micronutrient deficiencies in the population consuming crops grown in such soil.

▪ **Solutions Suggested:**

- Application of zinc to crops on zinc-deficient soils increases yields of rice, wheat, maize, and oats by over 75% more than application of only nitrogen, phosphorus, and potassium fertiliser.
- **Zinc-enriched fertilisers can enhance soil zinc for three to four years after application**, which means that it could be an effective long-term intervention, requiring less short-term maintenance than other solutions.

What is the Status of Nutrient Deficiency in India Soil?

- India's soil has been facing widespread **deficiency of nitrogen and phosphorus for a long time**. Potassium deficiency became more prevalent in the 1990s, and **sulphur deficiency emerged as a major problem in the 2000s**.
- An analysis of 0.2 million soil samples from 28 states by scientists associated with **All India Co-ordinated Research Project** on Micro- and Secondary Nutrients and Pollutant Elements in Soils and Plants (AICRP-MSPE) **under the Indian Council of Agricultural Research shows:**
 - **Zinc Deficiency:** Approximately 36.5% of India's soil is deficient in zinc.
 - **Iron Deficiency:** About 12.8% of the country's soil is deficient in iron.
 - **Other Micronutrients:** Apart from zinc and iron deficiencies, the research indicates deficiencies in other micronutrients as well:
 - Boron deficiency is found in 23.4% of soils.
 - Copper deficiency is observed in 4.20% of soils.
 - Manganese deficiency affects 7.10% of soils.

Note

The AICRP-MSPE was launched in 1967 to analyse micronutrient deficiency in soil across the country. Since 2014, the project has shifted focus to analysing the link between soil health and human health.

What can be Done to Shift Towards Soil-Centric Agriculture for Sustainability?

- **Conservation Agriculture and Efficient Farming Techniques:**
 - Implement conservation agriculture techniques like no-till, residue mulch, and crop rotations to restore soil nutrients and health.
 - Discourage traditional fertiliser broadcasting in favor of seed-cum-fertiliser drill machines to enhance water use efficiency.
- **Embracing Diversity and Innovation:**
 - Encourage cover crops, mulching, agroforestry, and smart soil solutions like Bhoomitra and Krishi-RASTAA.
 - Promote practices that enhance sequestration, diversify crops, eliminate residue burning, and adopt precision farming with technology and AI.
- **Restoration and Reclamation Methods:**
 - Advocate for **carbon farming**, reclaim saline/alkaline soils, and regulate micronutrient use while minimizing chemical inputs.
 - Utilize mechanization for efficient fertilizer placement and integrate organic manures for improved soil health.

What are the Initiatives to Improve Soil Health?

- [Soil Health Card Scheme](#)
- [Organic Farming](#)
- [Fertilizer Self-Sufficiency](#)
- [Digital Agriculture](#)
- [Carbon Farming](#)
- **Paramparagat Krishi Vikas Yojana**

▪ The Nutrient Based Subsidy (NBS) Scheme

Conclusion

By promoting sustainable land management, biodiversity, and educational outreach, World Soil Day underscores the critical role of soil in Earth's sustenance. It calls for concerted efforts to preserve and restore soil health, ensuring a prosperous and sustainable future for generations to come.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. The black cotton soil of India has been formed due to the weathering of

- (a) brown forest soil
- (b) fissure volcanic rock
- (c) granite and schist
- (d) shale and limestone

Ans: (b)

Exp:

- Black soil, also known as regur soil or black cotton soil, is ideal for growing cotton. The climatic conditions along with the parent rock material are the important factors for the formation of black soil. Black soil is typical of the Deccan trap (Basalt) region spread over northwest Deccan plateau and is made up of lava flows (fissure volcanic rock).
- The Deccan Plateau includes parts of Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh and some parts of Tamil Nadu. Black soil also covers upper reaches of the Godavari and the Krishna, and the north Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh and some parts of Tamil Nadu.
- Chemically, the black soils are rich in lime, iron, magnesia and alumina. They also contain potash. But they lack phosphorus, nitrogen and organic matter. The colour of the soil ranges from deep black to grey.
- Therefore, option (b) is the correct answer.

Q. Which of the following statements regarding laterite soils of India are correct? (2013)

1. They are generally red in colour.
2. They are rich in nitrogen and potash.
3. They are well-developed in Rajasthan and UP.
4. Tapioca and cashew nuts grow well on these soils.

Select the correct answer using the codes given below:

- (a) 1, 2 and 3
- (b) 2, 3 and 4
- (c) 1 and 4
- (d) 2 and 3 only

Ans: (c)

