

Soil Health

Indicators (units)

1. Soils deficient in nitrogen (percent)
2. Soils classified as “very low” in nitrogen (percent)
3. Soils classified as “low” in nitrogen (percent)
4. Soils classified as “medium” in nitrogen (percent)
5. Soils classified as “high” in nitrogen (percent)
6. Soils classified as “very high” in nitrogen (percent)
7. Soils deficient in phosphorus (percent)
8. Soils classified as “very low” in phosphorus (percent)
9. Soils classified as “low” in phosphorus (percent)
10. Soils classified as “medium” in phosphorus (percent)
11. Soils classified as “high” in phosphorus (percent)
12. Soils classified as “very high” in phosphorus (percent)
13. Soils deficient in potassium (percent)
14. Soils classified as “very low” in potassium (percent)
15. Soils classified as “low” in potassium (percent)
16. Soils classified as “medium” in potassium (percent)
17. Soils classified as “high” in potassium (percent)
18. Soils classified as “very high” in potassium (percent)
19. Soils deficient in sulphur (percent)
20. Soils deficient in boron (percent)
21. Soils deficient in copper (percent)
22. Soils deficient in iron (percent)
23. Soils deficient in manganese (percent)
24. Soils deficient in zinc (percent)
25. Soils deficient in organic carbon (percent)
26. Soils classified as “very low” in organic carbon (percent)
27. Soils classified as “low” in organic carbon (percent)
28. Soils classified as “medium” in organic carbon (percent)
29. Soils classified as “high” in organic carbon (percent)
30. Soils classified as “very high” in organic carbon (percent)

Data Sources

Soil Health Card Scheme

Institution Who Collected Primary Data

Integrated Nutrient Management (INM) Division
Ministry of Agriculture and Farmers Welfare

The Department of Agriculture, Cooperation and Farmers Welfare provides guidance in technical matters.

Years Data Have Been Collected

Data are collected in cycles: First cycle from 2015-16 to 2016-17, second cycle from 2017-18 to 2018-19, third cycle for 2019-20, fourth cycle for 2023-24

Years Data Are Compiled For

2015-16 to 2016-17 and 2017-18 to 2018-19 cycle

Please note that the data compiled for the Anuvaad data plug-in and available here are no longer available through the soil health card scheme portal.

Population Subgroups Available

Data are available at the block and village level

Methods of Data Collection

Villages are selected using a stratified sampling methodology. Samples are collected from marginal, small, and large farms to address variations that arise due to different management practices. Within each farm size class, samples are chosen to represent all possible soil fertility variations.

The following 12 parameters are tested in soil samples:

- Major nutrients
 - Nitrogen (N)
 - Phosphorus (P)
 - Potassium (K)
- Secondary nutrients
 - Sulphur (S)
- Micronutrients
 - Boron (Bo)
 - Copper (Cu)
 - Iron (Fe)
 - Manganese (Mn)
 - Zinc (Zn)
- Physical parameters
 - pH¹
 - Electrical conductivity¹⁵
 - Organic carbon

¹Data not currently available in Poshan Atlas.

Soil samples are drawn in a grid of 2.5 ha in irrigated area and 10 ha in rainfed area with the help of GPS tools and revenue maps. Soil samples are taken generally two times in a year, after harvesting of Rabi and Kharif Crop, or when there is no standing crop in the field. The ideal time for collection of soil samples is between harvests of one crop and sowing/planting of other crops when fields are vacant. Soil samples are collected by a trained person from a depth of 15-20 cm by cutting the soil. It is collected from four corners and the center of the field and mixed thoroughly and a sample of this is picked up and transferred to the soil test laboratory for analysis. Shaded areas are avoided. Details of the farmer, land, soil, GPS coordinates, etc. are recorded. It will then be.

Criteria of samples to be taken:

- (i) Irrigated area – at 2.5 ha grid for marginal and small holdings
- (ii) Irrigated area – one sample each holding for semi-medium, medium and large holdings
- (iii) Rainfed area – at 10 ha grid for marginal, small, semi-medium and medium holdings
- (iv) Rainfed area – one sample each holding for large holdings

Various laboratories conduct soil tests per SHC guidelines:

- Mini Soil Testing Laboratories at Village level by Village Entrepreneurs.
- At the Soil Testing Laboratory (STL) owned by the Department of Agriculture and by their own staff.
- At the STLs owned by the Department of Agriculture but by the staff of the outsourced agency.
- At the STLs owned by the outsourced agency and by their staff.
- At Indian Council of Agricultural Research (ICAR) Institutions including Krishi Vigyan Kendras (KVKs) and State Agricultural Universities (SAUs).
- At the laboratories of the Science Colleges/Universities by the students under the supervision of a Professor/ Scientist.

Definition of “deficiency”²:

Category	Indicator	Deficiency Cut-point
Major nutrients	Organic Carbon	<0.5%
	Phosphorous	<11 kg/ha
	Potassium	<120kg/ha

² Source: Indian Institute of Soil Science, Bhopal. Cut-points may vary by state.

	Nitrogen	<280kg/ha
Secondary nutrients	Sulphur	10ppm
Micronutrients	Zinc	0.6ppm
	Manganese	2.5ppm
	Copper	0.2ppm
	Boron	0.5ppm
	Iron	4.5ppm

Definition of very low, low, medium, high, and very high nutrient content³:

Indicator	Very Low	Low	Medium	High	Very High
Organic Carbon (%)	<0.25	0.25-0.5	0.5-0.75	7.5-1.0	>1.0
Phosphorous(kg/ha)	<5	5-10	10-25	25-40	>40
Potassium (kg/ha)	<60	60-120	120-280	280-560	>560
Nitrogen(kg/ha)	<140	140-280	280-560	560-700	>700

Interpreting Data and an Example

In 2018, 51.55% of soils in the district of East Godavari, Andhra Pradesh, are classified as deficit in Iron, while only 0.49% of soils in Vizianagaram are deficit in Iron. However, only 4.34% and 1.99% of soils in Vizianagaram are classified as “high” or “very-high” in Nitrogen respectively.

References and Further Reading

Soil Health Card website: <https://www.soilhealth.dac.gov.in/>

Operational Guidelines for Implementation of the Soil Health Card Scheme:

<http://mpkrishi.mp.gov.in/hindisite/pdfs/SHC.pdf>

Notes on Data Processing

For soil deficiency in terms of major nutrients, all "0" were displayed as "NA" as SHC report on deficiency of major nutrients (N, P, K, OC) does not differentiate between "0" and unavailable data.

³Source: Indian Institute of Soil Science, Bhopal. Cut-points may vary by state.