# It’s Time to Feed Our Soil

Dr Anushiya J.

Today is World Soil Day. Established as a means to raise global awareness on the significance of healthy soil and its sustainable management, the first World Soil Day (WSD) was observed on 5th December 2014.

This year, the WSD campaign “Soils: Where food begins” focusses on creating better awareness on the importance of maintaining healthy ecosystems, and therefore, human well-being, primarily by dealing with the growing challenges in soil management, increasing soil awareness, and encouraging societies to improve soil health.

Soil — the second-largest natural carbon sink after oceans — has an enormous capacity to capture atmospheric carbon dioxide. Healthy soils are at the heart of healthy food production. Soil health is an asset for our agrarian economy, social development, and sustainability.

When functioning with loads of microorganisms, adequate water, air, minerals, and organic matter, soils are very much alive and healthy, sustaining ecosystems. But years of agriculture practices undertaken to meet the food demand of the growing population, soil erosion, and changing climatic conditions have put our soils under immense pressure, adversely impacting their health.

The signs of the waning health of Indian soil are quite visible and worrisome now. The organic content in most of our cropland soils is less than 0.5% and it lacks macro- and micro-nutrients. According to Soil Health Survey (2019–20), over 55% of the country’s soil is deficient in nitrogen, 44% in organic carbon, and 42% in phosphorus. While the Desertification and Land Degradation Atlas of India reports that about 30% of India’s area is susceptible to land degradation, according to National Academy of Agricultural Sciences (NAAS) estimates, the annual average soil-loss rate in India is about 15 tonnes per hectare, with 5.37 to 8.4 million tonnes of nutrients loss. Consequently, most of the rainfed crops in India suffer an annual production loss of 13.4 million tonnes due to water erosion, amounting to a financial loss of INR. 205.32 billion.

The present and future projected climate-change scenarios are also not in favor of soil health. During the past 117 years (1901–2018), there has been a 0.7°C increase in India’s average temperature. This is likely to increase further by 4.4°C (relative to 1976–2005 average) by end of the century under the Representative Concentration Pathway (RCP) 8.5 Scenario, along with a 55% and 70% increase in the frequencies of occurrence of warm days and warm nights, respectively.

These changes in climate, and the resultant increase in climate hazards, put soil health at a grave risk by reducing soil’s organic matter, affecting soil structure, and increasing its vulnerability to erosion. Increasing temperature, and more warm and dry days hasten the decomposition rate of organic matter, thereby affecting its water storing capacity and overall stability.

In India, 68.4% of land erosion is due to water. Erratic rainfall patterns and heavy rainfall events increase soil erosion, which eventually erodes the top soil, unbalances nutrients (including soil's organic carbon), and affects soil compaction and its biodiversity. Further, rising sea levels increase sea-water intrusion, increasing the salinity of soil. With climate extremities becoming more frequent and widespread, the deteriorating soil health is nosediving farmers' productivity, particularly impacting the marginal farmers.

Hence, it is imperative to consider all environmental and socio-economic aspects within the framework of climate change mitigation and adaptation. The links between soil health, ecosystem function, human interventions, and climate change should be explored well. Formulating dedicated climate-inclusive and sustainable soil-management practices to enhance soil health is an important step. Further, adopting climate-smart soil management (CSSM) practices to prevent, maintain, and regenerate the soil would be key for a sustainable ecosystem. Reinforcing CCSM with strong policy initiatives will not only support productive adaptation but also help in mitigating the overall adverse effects of climate change.

Today, Franklin Roosevelt's famous statement from 1937: "The nation that destroys its soil, destroys itself," is perhaps more relevant than ever!

It is, indeed, time to nourish our soil.

*The author works in the area of adaptation & risk analysis in the Climate, Environment and Sustainability sector at CSTEP.*