



THEME – CARING FOR SOILS: MEASURE, MONITOR, MANAGE

WORLD SOIL DAY – DECEMBER 5, 2024



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CPREEC EIACP PC - RP on
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Government of India

**Theme: Caring for Soils:
Measure, Monitor, Manage**

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THEME – CARING FOR SOILS: MEASURE, MONITOR, MANAGE

- World Soil Day 2024 and its campaign “ **Caring for Soils: Measure, Monitor, Manage**” aims to raise awareness of the importance of small creatures like worms and microbes and the role they play in soil ecosystems.
- The eco system that exists currently is designed for all the different species of the world, whereby everyone has a key role to play not disturbing each other and without disturbing the ecological balance.
- Soil is an important component of the bio-geochemical cycle as it helps regulate important ecosystem processes, such as nutrient uptake, decomposition, and water availability.
- Small creatures, from microorganisms to those that are visible without the aid of a microscope, play ‘crucial roles in the soil ecosystem,’ as they ‘contribute to fertility and aeration and even help recycle nutrients.’
- Microorganisms are also vital for carbon fixation and play a fundamental role in fighting climate change.
- Without small creatures in soil, even trees cannot survive.

- To make the eco system work, sometimes, we need an army of environmentalists, scientists, complicated machinery and processes, wherein little creatures and occasionally other small animals help us to validate our nature and environment.



<https://www.fao.org/world-soil-day/zh/>

Microorganisms

- ❖ Microorganisms, as major decomposers, are widely distributed in soil, the composition and structure of which are complex and diverse.
- ❖ The core functions of the micro biome in the plant–microbe–soil system are as follows:
 - regulating soil properties and fertility.
 - forming mycorrhizal structures with plant roots.
 - participating in the degradation, fixation and transformation of soil pollutants.

- ❑ inducing systemic resistance of plants.
- ❑ decomposing plant and animal residues in soil.
- ❑ inhibiting the pathogens.
- ❑ the extracellular secretions of microbes can enhance the stability of soil aggregates.
- ❑ Some beneficial microorganisms, such as *Bacillus*, *Pseudomonas* and *Azotobacter*, have proven to be of great potential in plant growth promotion and soil remediation.



Termites

- ❖ Termites are a common group of insects which act as bio indicator of soil fertility.
- ❖ Termites have a great impact on soil properties, including redistribution of soil particles with nutrients and minerals, nest building, repacking and cementing, feeding activity, interaction with the organism, organic

matter (OM) decomposition, nutrient recycling, foraging behaviour and decaying.

- ❖ Termites play a major role in
 - ✓ Nitrogen fixation,
 - ✓ Acetogenesis,
 - ✓ Methanogenesis,
 - ✓ Soil transportation and
 - ✓ Nutrient movement.



Ants

- ❖ Ants are among the planet's most abundant insects.
- ❖ There are several species of ants and they are coloured red, black, brown and other colours.
- ❖ They are found everywhere: in the bark of trees, roots, branches, leaves, flowers and fruits.
- ❖ Ants act as decomposers by feeding on organic waste, insects or other dead animals.
- ❖ They help keep the environment clean.
- ❖ Carpenter ants, which make their nests in dead or diseased wood, considerably accelerate the decomposition process of timber.
- ❖ After the ants leave, fungi and bacteria grow in the galleries and break down the lignin and cellulose on large surfaces.
- ❖ Ants are predators of other insects and their eggs.
- ❖ In their natural habitat, they are a source of food for many invertebrates and vertebrates, including woodpeckers and other insectivorous insects.

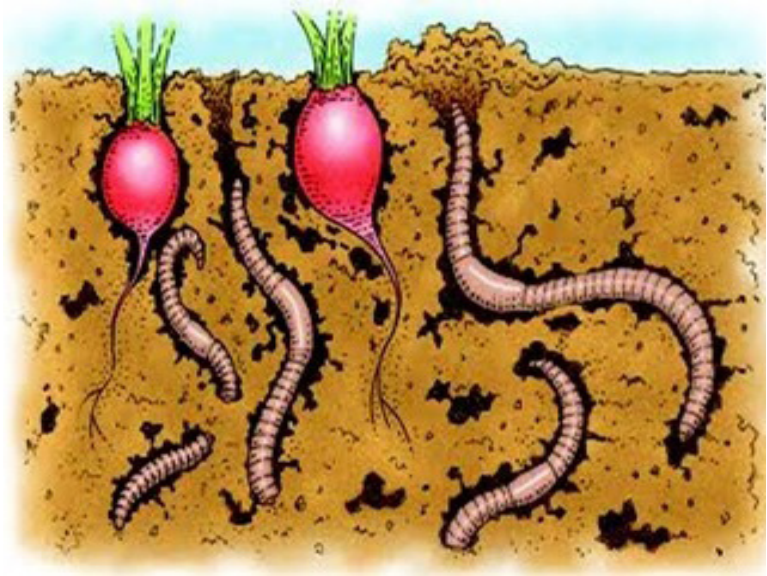




Earthworms

- ❖ Earthworms can play a variety of important roles in the eco system.
- ❖ Earthworms are known as farmers' best friends because of the multitude of services they provide that improve soil health and consequently, plant health.
- ❖ Their feeding and burrowing activities incorporate organic residues and amendments into the soil, enhancing decomposition, humus formation, nutrient cycling and soil structural development.
- ❖ As earthworms feed, they produce waste called castings.
- ❖ Earthworm castings are up to five times higher in nitrogen than the surrounding undigested soil.
- ❖ Their casts also contain more potassium, minerals, phosphorus and microorganisms.
- ❖ This natural plant fertilizer promotes flowering, root development, pest resistance and overall plant health and growth.





Snails

- ❖ Land snails serve an important role in the eco system.
- ❖ Land snails only eat a very small quantity on the food web, as most land snails will consume rotting vegetation like moist leaf litter, fungi and sometimes, they eat soil directly.
- ❖ The land snail relies on a diet rich in calcium and other nutrients to support the growth and repair of its shell as well as its overall health.
- ❖ Snails then, in turn are consumed by a variety of predators that rely on them for their calcium and other dietary needs.
- ❖ A great diversity of animal life feeds upon land snails, from insects to lizards and snakes, salamanders, birds and mammals.
- ❖ Some species of fireflies consume snails exclusively during their larval stage.





