Soils to Sequester Carbon

What is the issue?

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The ability of soils to sequester carbon should be given a serious focus by policymakers in the context of climate change actions.

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What is carbon sequestration?

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- It is the process by which carbon dioxide is removed from the Earth's atmosphere and then stored in liquid or solid form.
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- It could involve both natural and artificial processes to remove and store carbon.
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- Significant carbon pools on earth are found in the earth's crust, oceans, atmosphere and land-based ecosystems.
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- The prime purpose of artificially doing this is to mitigate or delay global warming and avoid extreme climate change.
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What is the need for focussing on soils?

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- **Agricultural Practices** - After the changes undertaken as part of the Green Revolution, crop yields increased for several decades.
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- But parallelly there has also been a dramatic increase in the use of chemicals as pesticides, herbicides and fertilizers.

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- The resultant degraded soils are getting to be a prime reason for undermined agricultural yields in many places now.
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- **Industrial changes** to agriculture have led to a range of adverse effects including:\n
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i. loss of biodiversity
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ii. elimination of beneficial microbes and insects
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iii. reduction in yield
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iv. contamination of water bodies and soils
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v. increasing toxicity, etc
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- **Global Warming** - Currently, the world is on a path to be about 3ºC warmer than pre-Industrial times.
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- This is despite adhering to 2015 Paris climate deal commitments.
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- Atmospheric concentrations of carbon dioxide have crossed limits and oceans are already turning acidic.
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- But, policies are largely focussed on reducing greenhouse gas (GHG) emissions from electricity sector, transport and industry.
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- The policy shortfalls call for a renewed focus in understanding how soils can serve as carbon sinks to address the increasing pressures.
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How effective are soils as carbon sinks?

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- **SOC** - Soil organic carbon (SOC) comes from plants, animals, microbes, leaves and wood, mostly found in the first metre or so.

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- Soils contain around 2,300 Gt (1 gigatonne = 1 billion tonnes) of organic carbon, making this the largest terrestrial carbon pool.
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- **Benefits** - Increasing SOC through various methods can improve soil health.
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- It can contribute to agricultural yield, food security, water quality, and also reduce the need for chemicals.
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- It helps address carbon mitigation and also improve conditions of fresh water, biodiversity, land use and nitrogen use.
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- Moreover, carbon sequestration in soils has the potential to offset GHG emissions from fossil fuels by up to 15% annually.
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- Utilising this option would thus offer the breathing time before other technologies can help transiting to a zero-carbon lifestyle.
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How is it achieved?

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- There are many conditions and processes that determine changes to SOC content.
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- These include temperature, rainfall, vegetation, soil management and land-use change.
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- Thus, increasing Soil Organic Carbon involves adopting sustainable agricultural practices to keep these factors in balance.
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- The approaches to increase SOC include:
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i. reducing soil erosion
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ii. no-till-farming
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iii. use of cover crops
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iv. nutrient management

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v. applying manure and sludge
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vi. water harvesting and conservation
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vii. agroforestry practices, etc
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What should the government do?

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- India does have a large number of successful **sustainable agricultural practices.**
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- The **knowledge of farmers** who have successfully experimented with these methods must be considered in research and policy.
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- State-level policy makers should identify the **kinds of support** needed by farmers with small holdings to transition from existing practices.
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- There is also a need for revising the existing **fertiliser subsidy policy** and promoting organic fertilizers.
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- The ability of soils to sequester carbon is thus a win-win strategy for farmers, people and for climate change.
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Source: The Hindu

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