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# No Soil No Food

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## Introduction

Soil is a mixture of organic matter, minerals, gases, liquids, and organisms that together support life. Earth's body of soil, called the pedosphere, has four important functions: as a medium for plant growth, as a means of water storage, supply and purification, as a modifier of Earth's atmosphere, as a habitat for organisms.

## Importance of Soil

- Soil is the backbone of our food security. Without healthy soils, farmers wouldn't be able to provide us with feed, fiber, food, and fuel.
- Soils act as a pantry for plants, storing and cycling essential nutrients and minerals that plants need to grow.
- Soils maintain adequate aeration for plants, providing oxygen for microbes, insects and plant roots.
- Soils are habitats for beneficial soil microbes; these organisms are nature's hidden helpers. They form synergistic relationships with plants to protect them from stress and provide them with nutrients, among other tasks.
- Soils are homes for many other organisms like insects that lay and hatch eggs in the soil.
- Soils filter surface water of dust, chemicals and other contaminants. This is why underground water is some of the cleanest sources of water.
- Healthy soils help protect the planet from climate change. "Soils remove about 25 percent of the world's fossil fuel emissions each year."
- Healthy soils provide farmers with better crop yields and protect plants from stress.

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- When it comes to human health, almost all of the antibiotics we take to help fight infection were obtained by soil microbes.
- Healthy soils protect the land from erosion.
- Soil is a non renewable natural resource. According to the Food and Agriculture Organization (FAO), it can take hundreds to thousands of years to form a centimeter of soil. But, that single centimeter of soil can be lost in a single year due to erosion.
- Soil is made up of 45% minerals, 25% water, 5% organic matter and 25% air.
- Soil acts as a holding facility for solid waste.
- Soils help regulate the Earth's temperature.
- Healthy soils mitigate the impacts of extreme weather events.
- "soils help control weeds, plant pests, and disease."

**The cause of soil degradation and how it affects us**

Soil is not an inert medium but a living ecosystem that is essential to life. It takes hundreds and thousands of years to form an inch of topsoil, and many more centuries before it is fertile. While soil degradation is a natural process, it can also be caused by human activity. In the last few decades, soil degradation has been sped up by intensive farming practices like deforestation, overgrazing, intensive cultivation, forest fires and construction work. These actions disturb soil and leave it vulnerable to wind and water erosion, which damages the complex systems underneath. Silvia says, 'Several practices associated with intensive agriculture, especially tilling, disrupt soil structure. They accelerate surface runoff and soil erosion, loss of organic matter and fertility and disruption in cycles of water, organic carbon and plant nutrients. These practices also have a major negative impact on soil biodiversity. 'When soil degrades, the processes that take place within it are damaged. This causes a decline in soil health, biodiversity and productivity, leading to issues at all levels of many ecosystems, and resulting in large environmental consequences such as floods and mass migration.'

**Five Reasons We Can't Live Without Soil**

1. **We literally can't live without it:** Scientists have found that the world's soil is one of our largest reservoirs of biodiversity, containing almost one-third of all the planet's life! A teaspoon of soil alone may be home to *billions* of microbes. And the life that

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resides in the soil—the microbes, fungi, mites and critters make up a complex web of interrelationships.

2. **Soil is second only to our oceans as the largest carbon repository on the planet:** Due to all that organic matter, soil is also the largest source of organic carbon, a vessel for approximately 75% of the carbon on land. Soil's natural tendency to store carbon is essential for mitigating and adapting to climate change, as well as improving flood and drought resilience.
3. **Soil is the planet's largest natural water filter:** With the cooperation of its microorganisms, nutrients like calcium, magnesium and potassium are absorbed by the soil and removed from the water supply, while soil microbes decompose organic pollutants and play an important role in the nitrogen cycle making nutrients available for plants to access as needed.
4. **Without soil, the world's food web would be in trouble:** Nearly everything we humans eat can be traced back to soil, and that's true for other animals as well. Wild plants need healthy soil to thrive, so other species can eat the leaves and seeds and fruit and predators can eat the plant eaters.
5. **Healthy soil, healthy people:** Did you know microorganisms that live in soil are used to make medicine that treat diseases? In fact, nearly all of the antibiotics we take to help us fight infections come from soil. These critters have given us many life-saving medications, like the antibiotic streptomycin, and cyclosporine—a drug used to prevent transplant patients from rejecting their new organs.

**Soils are a crucial ally to food security and nutrition**

Healthy soils produce healthy crops that in turn nourish people and animals. Indeed, soil quality is directly linked to food quality and quantity. Soils supply the essential nutrients, water, oxygen and root support that our food-producing plants need to grow and flourish. They also serve as a buffer to protect delicate plant roots from drastic fluctuations in temperature. Food availability relies on soils: nutritious and good quality food and animal fodder can only be produced if our soils are healthy living soils. Over the last 50 years, advances in agricultural technology and increased demand due to a growing population have put our soils under increasing pressure. In many countries, intensive crop production has

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depleted the soil, jeopardizing the soils productive capacity and ability to meet the needs of future generations.

**Are any alternatives to grow food without soil?**

Here are many methods of growing food without soil, using hydroponics, geoponics and aquaponics. The soilless cultivations cannot be done in many of the worlds and it can't be done in all sectors of farmers, it is very costly and it should have the minute control in all over the aspects and it cannot be done in all the crops. A soilless cultivation also requires your time and commitment, Experiences and technical knowledge, Organic debates, Water and electricity risks, System failure threats, Initial expenses, Long return per investment, Diseases & pests may spread quickly

**Conclusion**

Soil is the backbone of our food security. Without healthy soils, farmers wouldn't be able to provide us with feed, fiber, food, and fuel. Soils are habitats for beneficial soil microbes healthy soils provide farmers with better crop yields and protect plants from stress. While soil degradation is a natural process, it can also be caused by human activity. 'When soil degrades, the processes that take place within it are damaged. This causes a decline in soil health, biodiversity and productivity; with this we can say that no soil no food occurs, which is unimaginable.