



## Soil Degradation and its Solutions

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A loss in soil quality brought on by incorrect land use, agriculture, and urban or industrial operations is referred to as "**soil degradation**". It has an impact on the soil's physical, biological, and chemical composition, leading to changes in the soil's acidity, salinity, floods, toxic pollutants, erosiveness, and structural durability. Global environmental challenges are brought on by excessive soil deterioration, which also causes short- and long-term environmental problems. Despite natural reasons, modern activities and climate change greatly speed up the deterioration of soil. In order to address soil degradation's influence on the environment, it is essential to understand its origins, impacts, and remedies.



### Causes of soil degradation

Numerous elements, including **physical, biological, chemical, industrial, mining, and negligent agricultural practises**, contribute to soil deterioration. Soil erosion is caused by physical forces such as rainfall, surface runoff, floods, wind erosion, tillage, and mass movements, which has an impact on the fertility and condition of the soil. The deterioration of soil may also be caused by biological factors including human and plant activity, with bacterial and fungal overgrowth lowering crop yield and production potential. Alkalinity, acidity, and waterlogging are examples of chemical variables that can cause irreparable loss of nutrients and productivity. Minerals in the soil are exposed by deforestation, and improper or excessive fertiliser application might result in nutrient losses.

In addition to losing crop cover and releasing hazardous chemicals, industrial and mining operations also contribute to soil deterioration. Soil deterioration is also a result of poor agricultural techniques including overgrazing, ploughing, and mechanisation. Overgrazing negatively impacts soil quality and agricultural output by significantly contributing to soil erosion and nitrogen loss.

### Ill effects of soil degradation

Soil degradation is a major cause of land degradation. A large area of agricultural land is severely damaged due to erosion and chemical fertilizers, preventing regenerating the land. This decline in soil quality leads to water and land pollution, lowering the land's worth. Drought and aridity are also influenced by soil degradation, with factors like overgrazing, poor tillage methods, and deforestation contributing to desertification. Soil degradation also leads to the loss of arable land. World's agricultural land lost due to agrochemicals and soil erosion. This leads to increased flooding and pollution of waterways, as the soil erosion and

chemical fertilizers and pesticides are discharged into waterways, causing water scarcity and harming marine and freshwater ecosystems.

### **Solutions to Soil Degradation**

Numerous approaches may be used to treat soil degradation, such as minimising deforestation, reclaiming land, and stopping salinization. By modifying forests and plant cover and maintaining protected areas, deforestation can be decreased. As populations increase, people may learn about maintaining protected areas and managing forests sustainably. Reducing deforestation can enable soil to organically recover. Zero net deforestation must be prevented, and this requires the cooperation of governments, international organisations, and other parties.



Reclamation of land entails replenishing essential minerals and organic matter in the soil by the addition of plant leftovers and improved range management. Since prevention of salinization is more cost-effective than reclamation work in salinized areas, it is an environmentally benign alternative. A sustainable way of preventing the deterioration of soil quality is conservation tillage, which modifies the soil's natural state as little as possible.