

Depletion of Arable Land

Arable land is any land that can be used to grow crops. Many of the practices used in growing those crops can lead to the destruction of soil characteristics that make agriculture possible. As the human population has expanded, more and more land has been cleared for agriculture and other pursuits that degrade the soil and make erosion more likely to occur.



Soil is the earth's fragile skin that anchors all life on Earth. It is comprised of countless species that create a dynamic and complex ecosystem and is among the most precious resources to humans. Increased demand for agriculture commodities generates incentives to convert forests and grasslands to farm fields and pastures. The transition to agriculture from natural vegetation often cannot hold onto the soil and many of these plants, such as coffee, cotton, palm oil, soybean and wheat, can actually increase soil erosion beyond the soil's ability to maintain itself.

The loss of fertile soil makes land less productive for agriculture, creates new deserts, pollutes waterways and can alter how water flows through the landscape, potentially making flooding more common. Soil erosion has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species. And degraded lands are also often less able to hold onto water, which can worsen flooding. Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification.



SEDIMENTATION

Land is often transformed from a forest or other natural landscape, such as floodplains and wetlands, into a crop field or pasture. When agriculture fields replace natural vegetation, topsoil is exposed and can dry out. The converted land is less able to soak up water, making flooding more common. Soil can be blown away by the winds or washed away by rains. This sedimentation can damage freshwater and marine habitats and the local communities that depend on them. There are methods to improve soil water holding capacity as well as restoration and maintenance of wetlands.



DESERTIFICATION

Desertification is a process of land degradation that occurs when land that was originally of another type of biome turns into a desert biome due to various factors, including climate variations and human activities. Effects include land degradation, soil erosion, and a loss of biodiversity, with huge economic costs for nations where deserts are growing. Countries affected by desertification do not have to be located only in hot regions of the world because it is the local climate and land use that shape the health of the land. Desertification reduces the ability

of land to support plant life. Loose soil buries plants or exposes their roots to the sun, so they cannot fulfill their function. Already scarce rainwater gets washed away instead of being drawn into the soil, and remaining plants do not have enough moisture to survive dry spells as they used to. If the land is used for grazing at this stage, it only results in a quicker loss of plant species and total degradation.



OVERFARMING

The conversion of natural ecosystems for crop production can lead to high rates of erosion and loss of topsoil and nutrients. Overfarming can reduce the productivity, usefulness, and biodiversity of the land. This reduces the ability for plants to grow and water to regenerate, which harms soil microbes and results in serious erosion of the land. Overgrazing happens when vegetation or pasture is repeatedly removed from land and it is not given enough time to continue growing. Overgrazing causes the plant matter to decline and contributes to numerous negative consequences to both the animals and the land.



DEFORESTATION

Tree roots anchor the soil. Without trees, the soil washes or blows away, which can lead to vegetation growth problems. Additionally, without plant cover, erosion can occur and sweep the land into rivers. As land loses its fertile soil, agricultural producers move on, clear more forest and continue the cycle of soil loss. For example, Haiti and the Dominican Republic are countries that share the same island, but Haiti has much less forest cover than the Dominican Republic. As a result, Haiti has endured more extreme soil erosion, flooding and landslides.



POLLUTION

Pesticides and other chemicals used on crop plants have helped farmers to increase yields. Scientists have found that overuse of some of these chemicals changes soil composition and disrupts the balance of microorganisms in the soil. This stimulates the growth of harmful bacteria at the expense of beneficial kinds. Soil eroded from the land, along with pesticides and fertilizers applied to fields, washes into streams and waterways



CLIMATE CHANGE

Climate change can lead to land degradation for many reasons, including significantly reduced rainfall, droughts, and frequent outbreaks of wildfires that destroy remaining vegetation, weakens livestock, and affect the ability of crops to reach maturity for harvest. The net effect of climate change on world agriculture is likely to be negative. Although some regions and crops will benefit, most will not. Indirect climate impacts include increased competition from weeds, expansion of pathogens and insect pest ranges and seasons, and other alterations in crop ecosystems. Overall, climate change will have a huge effect on land use, the future use of soils, and may even require significant adaptations to meet the changing climate.