



eChapter 9

Soil

Human life depends on soil to meet some of our most basic needs, including agriculture, key natural resources, and the physical foundation for our homes, schools, meeting places, businesses, roads, etc.

Soil protects the food chain and our drinking water by serving as the filter and buffer between the Earth's air, water, rocks, and living forms. An average soil sample contains 45% minerals, 25% water, 25% air, and 5% organic matter. There are hundreds of thousands of types of soils worldwide, and each is its own unique micro-ecosystem.

Soil is a complex non-renewable natural resource that is alive with billions of microscopic life. There are more individual living organisms in a spoonful of soil than there are people on Earth. [\[source\]](#)

The natural process of creating thin layers of new soil takes centuries, but the unnatural process of soil loss is rapid. Precious soil is being lost worldwide because of water and wind erosion, new construction, and pollution.

The UN Food and Agriculture Organization (FAO) estimates that the global loss of productive land through erosion is the equivalent of 50 to 70 billion square meters per year. [\[source\]](#) In addition, billions more are lost each year because of human construction and pollution.

There are at least 36,000 known hazardous waste sites on U.S.A. soil, which will cost an estimated \$100 billion to \$500 billion to clean up [\[source\]](#). The U.S.A. represents less than 5% of the world's population, and 20% of the world's wealth [\[source\]](#), so the total number of hazardous waste sites in the world might be calculated as somewhere between 130,000 and 720,000 if haz-mat sites are proportionate to a country's wealth or population, based on data for the U.S.A. These numbers, though staggering, may be conservative estimates.