

## Soils and History

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Soils are indispensable for human life. Terrestrial plants and animals have provided the greatest part of human nourishment over the course of history and continue to do so. Soil-derived biomass has been the prime source of fuel. In recent years, using soils to grow new energy crops is of increasing importance for climate protection. Soil has been and is still used as building material and decoration, as protective cover for skin and as material for vessels and ovens. The practice of geophagy, consuming soil as medicine or nourishment, was once more widespread than it is now.

Not only has soil quality determined individual wealth, but also settlement patterns, food choices and livelihoods in general and can thus be called a defining factor of human history. Wars have been fought over fertile land, and the value of soils is the basis of legal systems based on territory.

Anthrosols, soils co-created by humans, are widespread, with Terra Preta do Indio, the dark, fertile soils of the Amazon, as one prominent example. The plaggen soils resulting from centuries of adding grass sod soaked with animal droppings from being used as bedding in stables to otherwise marginal soil, or the soils of paddy rice fields are other examples of long-term soil management. Erosion prevention measures included stone mulching and terracing. Irrigation added further complexity, making cycles of leaching excess salt after periods of irrigating fields necessary. The administrative needs of building and maintaining infrastructure (often built partially with soil as in earth dams) created the need to develop forms of long-term documentation. Some of the earliest of such documents were made of soil themselves, i.e. clay tablets with cuneiform script.

All agriculture-based civilizations tried to document and systematize knowledge about soils and soil fertility. Soils were distinguished in several dimensions already in ancient China and in the Roman Empire. Soil classifications as well as tests for its qualities and suitability for crops were developed. Roman polymath Pliny the Elder held - echoing agricultural treatises of his time - that wine would taste like the soil it grew on, an early recognition of what is marketed as 'terroir' at present. The European roots of ecological thought can be found in Theophrastus' of Eresos (c. 371 – c. 287 BC) botanical writings, where he discusses the influence of soil quality on plants. He maintains that different soils can completely change a plant, and mentions the pomegranate as an example.

Many cultures revered the soil, either personified as Mother Earth (e.g. Latin: Terra Mater or Tellus, Greek: Gaia) or as a numinous entity. The Chinese worshipped clods of soil at stone altars close to the fields, later on also personified them. Many goddesses and gods of fertility also include the aspect of soil fertility.

Soils are an important archive for cultural and natural history, preserving remains and artifacts. Under some circumstances, human interventions will leave a discernible imprint on aboveground biodiversity and plant cover over millennia, a testimony to the long-term entanglement of humans and soils.