Soil - Earth’s living skin

Soils are truly wonderful. They are major support systems of human life and welfare. They provide anchorage for roots, hold water long enough for plants to make use of it, and hold nutrients that sustain life - otherwise the Earth’s landscape would be as barren as Mars. Soils are home to myriad micro-organisms that accomplish a suite of biochemical transformations - from fixing atmospheric nitrogen to the decomposition of organic matter - and to armies of microscopic animals as well as the familiar earthworms, ants and termites. In fact, most of the land’s biodiversity lives in the soil, not above ground.

Different kinds of soil are spread across different landscapes - not randomly but in predictable patterns first identified 125 years ago by pioneering Russian pedologist Vasily Dokuchaev (1846-1903) as functions of parent material, climate, relief and living organisms acting over time. People are part of the equation too, and soils, like landscapes, are often manmade.

Without Soils, Earth’s Landscape Would be as Barren as Mars

Soils form with life; without life, there can be no soil - which is why Mars for instance has no soils, despite plentiful exposed and weathered bedrock. The above pictures show representatives of the major groups of soil organisms. In arid countries like Namibia, however, the soil contains comparatively little organic material.

While wind erosion is a slow steady process, rarely perceptible on a day-to-day basis, water erosion is usually much more evident, especially in an arid country with heavy seasonal rainfall like Namibia. The satellite images below show the Fish River before and during the 2006 floods, the right streamers of sand, dust and fine soil particles being blown out to sea by the winds.

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As rock layers contain the geological history of a given area through billions of years, so the distinctive horizons of a soil profile allow the reconstruction of the more recent past in landscape development. Also, Earth’s soil is one of our main life support systems and sources of food production. In cultivation districts throughout southern Africa, however, wind and - to a lesser degree - water erosion is an acknowledged problem. This is because of the prevalence of sandy soils (arenosols), high winds, cultivation practices, and low rainfall resulting in low plant biomass production and low soil organic material, which provide soil cohesion. Wind erosion is the loss of fine materials (fine silt and clay) from topsoil in the form of dust. By being depleted of this fine material, the soil loses much of its ability to provide plants with water and nutrients, and thus becomes less fertile.

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