

SOIL QUALITY, SOIL HEALTH, HUMAN HEALTH

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The paper, Soil: their implication to human health (a review by Abrahams, 2002)¹ highlights the important role of soil as geofactor in the relationship of many human diseases with the environment. Soils affect human health in two ways: directly or indirectly. The direct way is by ingestion (voluntary or involuntary), inhalation and dermal absorption. The indirect form occurs when the soil affects the atmosphere, hydrosphere or biosphere, and changes in these media affect human health, via air, water or food. When analyzing the direct and indirect effects of soils on human health is demonstrated that these effects are related to the following soil properties: a) retention capacity of elements and molecules including water, related to the amount and type of colloidal particles; b) the activity of soil organisms that can metabolize or inactivate elements and molecules; c) the spatial organization of solid particles (structure) at macro, micro and ultramicro levels, which regulates fluid transport in soil, and d) the soil resilience.

Soil quality considers the soil's capacity, within land use and ecosystem boundaries, to carry out its functions of biogeochemical cycling, partitioning of water, storage, release, buffering, and energy partitioning. A minimum data set of quantitative indicators for assessing the soil quality includes physical (texture, depth, porosity, and water retention), chemical (organic matter, pH, electrical conductivity, extractable N, P, and K), and biological (microbial biomass and soil respiration) characteristics. These characteristics reflect the same properties mentioned above.

Farmers' field diagnosis of soil health, a more integrative term preferred by farmers to soil quality, uses qualitative and sensory indicators. They include description of the plough layer (e.g. earthworms, erosion, tillage ease, feel, or smell), plants (crop appearance, seed germination, and roots), animals (animal health and wildlife), and surface water appearance.

Linkages between soil quality and plant, animal and human health as well as the perception of soil as a living, dynamic organism that functions holistically rather than as inanimate object have led to use synonymously the terms soil quality and soil health.

For all the foregoing, we conclude that when assessing the soil quality (or health) also is considering the influence of soil on human health.

[1] Abrahams P. W. (2002) *Sci. Tot. Environ*, 291: 1-32

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