

## **Sustainability of Soils**

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**Isaiah IC Wakindiki, PhD., Pr. Sci. Nat.**

School of Agriculture, University of Venda P. Bag X5050, Thohoyandou, 0950, South  
Africa &

University of South Africa, Department of Agriculture and Animal Health, Private Bag  
X6, Florida, 1710, South Africa

### **Summary**

Sustainability of soils requires a deliberate attention to the management of nutrients in the relevant terrestrial ecosystems and being cognizant of the functions of soil. This paper discusses nutrient management in agricultural, pasture, and forest ecosystems. The paper also assesses the role of microorganisms in aiding the acquisition of plant nutrients. Although fertilizer application often aims to enhance the soil's function to produce biomass, it should not adversely affect other soil functions such as the capacity to supply raw materials, physically support built structures, filtration, buffering, storage, facilitate bio-chemical transformations, as well as preservation of biodiversity, and culture. Introduction of water-borne sewage systems has interfered with the natural nutrient cycle, replacing it with a linear system that transports nutrients away from soils and into watercourses. Meanwhile, large-scale farming is causing significant nutrient removal through harvesting crops and enhancing erosion through tillage. Two important indicators of soil sustainability in pastures include the number of earthworms and soil organic matter content. Nutrient management in forest ecosystems should pay attention to the effects of acidic deposition, sustainable forestry, and carbon sequestration, water quality, biodiversity and agroforestry. This paper concludes that sustainability of soil requires an ecosystem approach, nutrients are increasingly being extracted from the soil and discharged in aquatic environment. It is imperative that we begin recycling phosphorus. Appreciation of the rhizosphere interaction is important for developing sustainable management practices and agricultural products such as biofertilizers.

Keywords: Terrestrial ecosystems, Nutrient cycle, Soil functions, Rhizosphere.