



Soil Science and Global Issues

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Sustainable management of soil is integral to any rational approach to addressing global issues of the 21st century. A high quality soil is essential to: i) advancing food and nutritional security, ii) mitigating and adapting to climate change, iii) improving quality and renewability of water, iv) enriching biodiversity, v) producing biofuel feedstocks for reducing dependence on fossil fuel, and vi) providing cultural, aesthetical and recreational opportunities. Being the essence of all terrestrial life, soil functions and ecosystem services are essential to wellbeing of all species of plants and animals. Yet, soil resources are finite, unequally distributed geographically, and vulnerable to degradation by natural and anthropogenic perturbations. Nonetheless, soil has inherent resilience, and its ecosystem functions and services can be restored over time. However, soil resilience depends on several key soil properties including soil organic carbon (SOC) concentration and pool, plant-available water capacity (PWAC), nutrient reserves, effective rooting depth, texture and clay mineralogy, pH, cation exchange capacity (CEC) etc. There is a close inter-dependence among these properties. For example, SOC concentration strongly affects, PWAC, nutrient reserve, activity and species diversity of soil flora and fauna, CEC etc. Thus, judicious management of SOC concentration to maintain it above the threshold level ($\sim 1.5\text{-}2\%$) in the root zone is critical to sustaining essential functions and ecosystem services. Yet, soils of some agroecosystems (e.g., those managed by resources-poor farmers and small landholders in the tropics and sub-tropics) are severely depleted of their SOC reserves. Consequently, Agronomic productivity and wellbeing of people dependent on degraded soils is jeopardized. The ecosystem C pool of the terrestrial biosphere has been mined by extractive practices, the nature demands recarbonization of its biosphere for maintenance of its functions and resilience. Commemorating 2015 IYS is timely to create awareness among policy makers and general public that soil should never be taken for granted.