

Abstract

The consequences of the accelerating deterioration of the environment indisputably threaten the future of humanity. The urgency of these concerns prompted the nations of the world to hold the U.N. Conference on Environment and Development in Rio de Janeiro, Brazil, in June of 1992. The principal outcome of the conference was AGENDA-21, an action plan elaborating strategies to halt and reverse environmental degradation and promote environmentally sound and sustainable development world-wide. What, then, can soil scientists contribute to accomplishing the goals and objectives of AGENDA 21 ? The environment, concurrent with economic growth, democracy, population and health, is one of the four pillars that together support and make sustainable development possible. Since the soil and land resource base is an essential component of the environment and its integrity a *conditio sine qua non* for the sustainability of many managed and natural biophysical systems, the active involvement of soil scientists in development issues is imperative. Soil scientists must participate prominently in the development of integrated approaches to planning and management of land resources that consider all environmental factors as well as social and economic aspects. Soil scientists must also contribute to the development of the techniques, processes, and regulatory policies and frameworks that can be combined to facilitate systems-based holistic approaches.

They should also play a pivotal role in enhancing the scientific understanding of land resource systems and ecosystem interactions. Basic to these endeavours, however, is the availability of adequate land resources data (soils, climate, vegetation, land use, topography etc.) either amassed over the years in conventional ways or generated by the non-traditional methods of data acquisition. These biophysical data are to be integrated with socio-economic aspects in the definition and development of land quality indicators that can be used to monitor whether or not we are on the path leading to sustainable development. Sustainable development, is meant to be directed towards "improving the quality of human life while living within the carrying capacity of the supporting ecosystems." We therefore have to look at the soil from two inter-related angles and development of land quality indicators that can be used to monitor whether we are on the path leading to sustainable development as: . a resource an environmental medium. . Soil has multiple functions and uses. . In addition to supporting plant growth, it enhances important environmental functions by acting as a filter and buffer for air, water, nutrients and chemicals, which are necessary for natural processes that maintain balances of energy and matter. It is used for construction (road and shelter) agricultural production and mining. Whatever the technology advances achieved, soil will always be necessary for humans to grow most of the food, fodder and fibre they need. About 95% of our food comes from land and grains provide at least 80% of the food world-wide. The food requirements of the projected population of 10 billion in 2050, is estimated to be 3.5 billion tonnes per year. This is at once a profound challenge and a great opportunity. It is only through an understanding of the natural soil processes, and interactions of the soil with water, air and biota, can we optimise the biological productivity of the soil, while ensuring ecological sustainability and environmental protection.