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## The role of nuclear techniques in preserving soil

M. Zaman

E-mail: [m.zaman@iaea.org](mailto:m.zaman@iaea.org)

Soil and Water Management and Crop Nutrition Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Department of Nuclear Sciences and Applications, International Atomic Energy Agency – IAEA, Wagramerstrasse 5, A-1400, Vienna – Austria

### Abstract

The world is facing an unprecedented dual challenge of enhancing food security while ensuring environmental sustainability, in particular conservation of natural resource base (soil). Soil, a living body and home for many microorganisms, plays an essential role in clean water and air, healthy agricultural crops, fruits and vegetables, productive grazing lands, diverse wildlife and forests, and even life-saving medicines. But we are losing this precious resource at increasing rates through land degradation which include soil erosion, degrading soil fertility, nutrient mining and toxicity, salinity and acidity. Soil degradation can lead to food insecurity, agricultural productivity decline, biodiversity loss and falling income, and ultimately to human migration and socio-political unrest. Worldwide, the degradation of our soils is estimated to total 1.9 billion hectares and the degradation is increasing at an alarming rate. Approximately 1.5 billion people, a quarter of the world's population depend directly on the food produced from this degraded land. Land degradation is further exacerbated by intensive farming, improper soil management as well as heavy rains and storms due to climate change. Approximately 11% of the irrigated land has been salt-affected globally, and up to 50% in some irrigated regions in Central Asia, North Africa, South Asia and the Arabian Peninsula. To meet the need for more food and to help protect soil and land, 'climate smart' agricultural practices must be developed to make soil more resilient against land degradation and the changing climate. The IAEA, in partnership with the Food and Agriculture Organization of the United Nations (FAO) through the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, assists the Member States of IAEA in using nuclear techniques to combat land degradation and adopting smart agricultural practices.