

Development of Sustainable Land Use and Management Strategies for Controlling Soil Erosion and Improving Soil and Water Quality (RAS/5/043)

Objectives

The overall objective is to develop sustainable land and water management strategies using fallout radionuclides for reducing soil erosion and improving soil and water quality in East Asia and the Pacific region. Specific objectives are i) to measure soil erosion and depositing over several spatial and time scales by combined use of Cesium-137, Lead-210 and Beryllium-7; ii) to establish soil redistribution-soil quality relationship under different land management practices by using the above results ; iii) to develop guidelines to assess soil quality based on radionuclides, as by i) and ii); and to apply management practices developed as a result of the soil redistribution-soil quality relationship for effectively improving soil and water quality as well as increasing organic carbon storage in soil.

Background

The East Asia and the Pacific region experiences severe soil erosion and sedimentation problems due to improper land use and poor farming practices. Soil erosion reduces land productivity, challenges agricultural sustainability, and degrades soil and environmental functions. Effective soil conservation can substantially reduce these problems. In this context, novel techniques for solving soil and water quality problems caused by soil erosion are very important in designing effective soil conservation measures. These techniques need to be developed and tested. A wide variety of farming systems exists in East Asia and the Pacific landscapes. These landscapes are endangered by soil erosion, and – conservation farming and soil protection systems require evaluation under a variety of agri-environmental conditions, to assess their effectiveness and establish specific regional recommendations of integrated soil and water management practices.

RCA project RAS/5/039, 'Restoration of Soil Fertility and Sustenance of Agricultural Productivity' addressed measurement of soil erosion, sedimentation and associated pesticide contamination. A limited number of research groups in the region have established basic capacities to conduct such investigations by using the fallout Cesium-137 technique. Through the implementation of RAS/5/039, the participating countries have realized the need and importance of this new project since it addresses the relationship between soil redistribution and soil and water quality, by the combined use of Cesium-137, Lead-210 and Beryllium-7. This project is also expected to promote collaboration of RCA Member States with other advanced research institutes.

National Commitment

Participating countries will each nominate a National Coordinator, and contribute other personnel, facilities, the operating costs of the projects, and host some events. It is important that participating countries provide a multidisciplinary team that will combine expertise in radionuclide techniques and in soil quality and cropping systems management.

Outcomes

1. Standardized methodologies and guidelines for the use of fallout radionuclides for the assessment of the soil quality-soil erosion relationship under different land use and management systems in the region made available.
2. Soil and water resource management practices developed using the data generated on soil erosion and soil quality and their implementation through field demonstration activities and training of farmers

Performance Indicators for Outcomes

1. Standardized methodologies and guidelines prepared and distributed by the end of 2007
- 2a. New management practices made available for the use of agricultural extension services in the Member States before end of 2008.
- 2b. New management practices disseminated to farmers through demonstrations and field training within a period of 1 year after the completion of the project.

Expected Project Impact

The project will result in tools to accelerate and improve the selection of effective land use and management measures to combat soil erosion and improve soil and water quality in the East Asia and the Pacific agricultural landscapes. This will be disseminated through national extension services, technical brochures, regional/local extension workshops, videotapes and other electronic means. Through these means, the transfer to farmers of new technologies for the appropriate management of different agricultural practices and sustainable production of crops will be achieved thus contributing to the national economy and socio-economic development in the region. It is expected that resource conservation policies in participating RCA countries will be established based on results obtained through the project.