

Assessment of soil erosion and sedimentation through the use of the ^{137}Cs and related techniques

I. QUERALT⁽¹⁾, F. ZAPATA⁽²⁾ and E. GARCÍA AGUDO⁽³⁾

*(1) Institute of Earth Sciences "Jaume Almera" CSIC. Natural Hazards Department.
Solé Sabarís St. s/n, 08028 Barcelona, Spain.*

*(2) Joint FAO/IAEA Division of Nuclear Applications in Food and Agriculture
International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria*

*(3) Division of Physical and Chemical Sciences, International Atomic Energy Agency
P.O. Box 100, A-1400 Vienna, Austria.*

During the last decades the international scientific community has been increasingly aware of both the risk and the effects of soil erosion and sedimentation processes cause to sustainable agricultural activities and the quality of the superficial environment. Soil erosion is a major environmental worldwide concern of our time. Over the past thirty years two main streams of thought have developed about the effects of soil erosion. The first one, mainly based on ecologist and environmentalist criteria, believes that soil erosion is a true disease on the land that quickly depletes the soil production capacity with some additional subsequent effects such as eutrophication of water reservoirs and pollution of natural waters. The second one supports that soil erosion is a natural process shaping the overall landscape. Development of fertile soils on river valleys can be attributed to erosion processes in the upper reaches of catchment. Loss of productivity due to soil erosion on agricultural lands can be easily compensated by small addition of fertilisers.

Whatever position we adopt a development of methods offering reliable data is needed. The use of models based on radiogenic isotopes distribution in soil profiles can offer valuable data set both in soil erosion and deposition. In addition, soil redistribution can be effectively assessed. These methods can be applied in a huge range of soil conditions in different geographic zones and the results are comparable at global scale. The International Atomic Energy Agency (IAEA) sponsored since 1995, the implementation of two co-ordinated research projects (CRP's) dealing with the application of the ^{137}Cs technique in soil erosion and sedimentation studies respectively. A join Meeting of both CRP's was organised by the Land and Water Conservation Group of the Institute of Earth Sciences "Jaume Almera", CSIC, in Barcelona, Spain, from 4 to 8 October 1999. This Special Issue of Acta Geologica Hispanica contains a compilation of selected papers presented at this event.

ACKNOWLEDGEMENTS

First of all, we have to acknowledge to the IAEA the offer to organise the Meeting and to the Spanish Consejo Superior de Investigaciones Científicas (CSIC) for the financial support provided. Some activities were organised in

the framework of the Progesed project (HID97-0581) of the Spanish Commission for Science and Technology (CICYT). Special thanks should go to Anna Coll from the Institut de Tècniques Energètiques of Universitat Politècnica de Catalunya, to Prof. Giovanni Pardini from the University of Girona and to the colleagues at the Institute, Dr. Francesc Gallart and Jérôme Latron, who collaborated in the organisation of the field-trip. We wish to thank all who refereed manuscripts for this Special Issue, and to the Editorial Committee of Acta Geologica Hispanica. Finally, we want to express our gratitude to everyone who contributed in some way to the success of this meeting and to Mother Nature, who cooperated magnificently with us.

Ignasi Queralt
Felipe Zapata
Edmundo García-Agudo