



Soil erosion in Southern Italy: the case study of Saccione Stream basin

S. Lo Curzio (1), **P. Magliulo** (1) & F. Russo (1)

(1) Dipartimento di Studi Geologici e Ambientali, Universita' degli Studi del Sannio, Benevento (Italy). E-mail: locurzio@unisannio.it, magliulo@unisannio.it, filrusso@unisannio.it

The Saccione Stream basin, approximately 230 km² wide, is located along the north-eastern slope of Southern Apennine chain (Southern Italy). The climate is typically of Mediterranean-type, being characterized by warm, dry summers and mild winters. Most part of the rainy precipitations occur during winter.

The integration of geomorphological field surveyed data and aerial orthophotographs analysis has highlighted the occurrence, in the study area, of a great number of newly-formed erosional landsurfaces. The geomorphological field survey pointed out that the landsurfaces at issue are mainly due to water erosion processes, mainly rill and sheet erosion. Evidence of gully erosion has also been observed. In some cases, the landsurfaces at issue are produced by mass movements, both slow (soil creep and solifluction) and rapid (landslides). Thus, the study area can be considered highly representative of the severe soil erosion occurring in most part of Southern Italy.

The above described geomorphological evidence has induced us to outline the lithological, pedological and land-use features of the study area by integrating original and literature data, with the aim to infer the causes of such a high vulnerability of the local landscape to the action of the erosional phenomena. In this paper, the results of such study are depicted. The assessment of the above listed features represents a preliminary result of a wider study aimed to investigate soil erosion processes at regional scale by means of an integration of classical geomorphological analysis techniques with other methodologies, e.g. remote sensing.

The substratum on which the newly-formed erosional landsurfaces detected in the study area are cut mainly consists of grey-bluish marly clay, Middle Pliocene - (?)

Lower Pleistocene aged. On these clayey deposits, fluvial and fluvio-lacustrine sediments, generally Pleistocene aged, unconformably overlie. These latter deposits mainly consist of polygenic gravels with lens-shaped interbeddings made up of travertine, sandy clay and sand. The lithological framework of the study area is completed by Upper Pleistocene, mostly fine-textured alluvial deposits.

From a pedological point of view, two dominant soil types occur in the study area. In the foothill area, the soils are fine-textured, display well-expressed vertic properties and olive-brown coloured topsoils and are characterized by high carbonate content. Such soils are classified as Chromic Calcixererts according to Soil Taxonomy. On the middle and upper parts of the slopes, the soils display dark-brown topsoils with accumulation of humified organic matter, are fine-textured and characterized by high carbonate content. These soils are classified as Typic Calcixerolls according to Soil Taxonomy.

The land-use in the study area is very homogeneous, as the arable fields (*sensu* Corine Land Cover) strongly predominates. Most part of the arable fields produces cereals and, locally, feed. The comparison of two aerial orthophotographs, taken before and after the harvesting respectively, has highlighted that the newly-formed erosional land-surfaces are much more widespread in the local landscape after the harvesting. This suggests a strong control of the agricultural practices in triggering erosional processes.

In conclusion, the results of this preliminary study seem to suggest that, in the study area, the runoff is the main process responsible of the severe soil erosion. The runoff is probably favoured by the low permeability, due to the fine texture, of both the dominant lithologies and the overlying soils. Furthermore, such natural vulnerability of the local landscape to soil erosion is likely to be strongly amplified by the agricultural practices.