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Monitoring of soil erosion in Sardinia (Italy)

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In Sardinia, a Mediterranean island, desertification is mainly related to the shift from traditional to more intensive agricultural systems. The over-exploitation of existing pastures and the creation of new pastures on unsuitable land induces an increase of the degradation of natural and environmental resources.

The impact of such agropastoral production systems on the environment is analysed by considering a specific case study in Sardinia. The aim of the present work is to present the experimental activities carried out in order to characterize the soil erosion processes due to this kind of land use.

A simplified experimental methodology was set up to study the dynamics of the channelled erosion process (rill erosion) by monitoring temporal evolution of soil roughness along the slope. The experimental plot is located on a steep slope in a hilly area of Central Eastern Sardinia, where intense agropastoral activities, particularly tillages, realised with heavy machinery, are causing severe soil erosion and compromising agricultural productivity.

The adopted procedure is based on the recording of altitudinal variations of soil surface along two couples of transects parallel to the contour lines. Measurement were carried out from October 2001 to December 2004. Meteorological parameters were recorded by a meteorological station located near the plots; rainfall erosivity and kinetic energy were calculated. Statistical and fractal techniques were used to quantify surface roughness. The total soil loss was also estimated, by referring to the temporal variation of the average value of the surface level along each transect.