



Interdisciplinary assessment of soil degradation due to agropastoral activities in Sardinia, Italy

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In Sardinia (Italy) agropastoral activities constitute an important factor of pressure on fragile soil resources. The Mediterranean type climate, characterised by irregular and intense rainfall, coupled with mountain and hill landscapes dominated by shallow soils, makes the region vulnerable to soil erosion and desertification. These processes are particularly accelerated by agropastoral activities, especially in some areas where social and economic drivers induce the farmers to clear natural vegetation cover or to intensify cropping or forage production and grazing on steep slopes. In these cases, severe soil loss (due to both water and tillage erosion) and degradation occur.

The present work is the result of a long lasting research, focused on understanding and assessment of soil degradation, by adopting an interdisciplinary approach. The impacts of land use on soil properties were studied in an area located in the central-eastern part of the Island, irrationally ploughed and overgrazed.

Sampling sites were selected in relation to land cover, land suitability and land use change patterns, in order to assess situations characterised by different degrees of pressure (intensity and time) and to compare degraded and pristine soils. Different kinds of soil degradation indicators were tested: physical (soil granulometry, soil density and resistance to surface penetration), chemical (routine set), biological (QBS, a soil quality index based on micro-invertebrate fauna), micromorphological (microporosity, quantified from thin sections through image processing software). The results show that during the last 15/20 years land use markedly influenced soil properties in

most of the surveyed sites. In particular, apart from the heavy soil loss observed, soil organic carbon, soil density and porosity were significantly affected, showing the unsustainability of current agropastoral activities. The work also contributed to build up a set of methods and indicators to monitor soil degradation in comparable Mediterranean rural contexts.