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I International Conference on Research for Sustainable Development in Mountain Regions

Book of Abstracts

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Soil rock fragment profiles in degraded and pristine sites of a mountain area, NE Portugal

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Soil rock fragments are an important feature in the analysis of geomorphological and pedological processes. The rock fragment profile of a soil reflects the prevailing weathering / pedogenetic conditions and the geomorphological instability, namely that associated to erosion. Accelerated erosion resulting from human activities may further disturb topsoil rock fragment profile, so that high surface rock fragment contents commonly indicate a severe soil degradation status. Soils with high rock fragment contents are significantly present in Mediterranean Europe. Leptosols (shallow, with high rock fragment content) are the most represented in NE Portugal in mountain areas. The potential erosion risk in these areas is severe and, due to actual and past land use options or practices and to extensive wildfires, mountain areas depict large tracts of degraded soils. This study compares rock fragment profiles in two sites of a mountain area of NE Portugal, aiming at testing the reliability of using topsoil rock fragments as an indicator of soil degradation. Selected sites were: climax forest (Serra da Nogueira), a pristine area; burnt scrubland (Aveleda), a severely degraded area. In both, lithology (schist), topography, elevation and climate are similar. Samples correspond to soil collected at 6 random points on a 100 m radius area in each site, in a 20x20cm square, successively removing a 3-5cm layer down to 20cm depth. During sampling, depth from a reference level to each freshly exposed layer surface was measured with a laser meter at 9 grid-fixed points. Samples were oven-dried and sieved, and rock fragments (>2mm) mass, volume and mean size were determined. Besides the expected significantly higher rock fragment contents in all layers of the degraded site as compared to the pristine one, results interpretation opened promising developments of rock fragment based indicators of soil degradation, presented and discussed in the paper.