



Connectivity analysis and its application to land management and erosion-reduction strategies in Mediterranean lands

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Soil erosion and land degradation are severe problems in parts of Mediterranean-type regions, particularly in marginal upland areas and those underlain by marl bedrock. In extreme cases the processes can lead to desertification and loss of productivity, ecosystem functioning and biodiversity of land. Conventional approaches to management of soil loss and land degradation have included reforestation programmes and construction of check dams. The EU-funded project RECONDES took the approach of identifying connectivity pathways of water and sediment movement in the landscape and of examining potential vegetation that could then be strategically targeted to reduce soil erosion and off-site effects. A basic premise is that much of the soil erosion occurs at particular types of location or hotspots in the landscape and that much of the removal is from linear pathways, much of it by gullying. The project developed methods of identifying and mapping connectivity at various scales, which are exemplified in this paper. Repeat mapping was carried out after rainfall events so that frequency and persistence of pathways could be detected. Potentially, rainfall thresholds for runoff and degrees of connectivity can be assessed. Key locations and hotspots of erosion were identified. The effect of vegetation in locations on slopes and in channels was investigated. The applied method combines the assessment of processes and mechanisms of land degradation through connectivity mapping with the understanding of vegetation types and conditions in order to guide the design of more effective and sustainable soil conservation strategies. The results of this research have been transferred to farmers

and local organizations via published practical guidelines.