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# Changes in hydrological connectivity induced by terracing in a small reforested catchment.

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Extensive reforestation works using terracing to reduce runoff and improve soil water availability for plants have been done in Spain for more than three decades as the main method to control soil erosion in degraded areas.

Terracing involves, in more or less degree, a modification of topography that can affect landscape connectivity. A field study was conducted to analyze the effects of terracing on the connectivity of a small (1.13 ha) fully reforested catchment. The catchment belongs to Cárcavo watershed, a semiarid degraded area in which extensive reforestation works were done in the 1970's.

Through field surveys and analysis of ortophoto images with a 0.5 m resolution five response units were identified. These response units are based on two main criteria: (i) morphology of the unit (slope, type of reforestation/terraces, bedrock, vegetation), and (ii) evolution of erosion and hydrological features. A map of hydrological connectivity was drawn on the tracks of flow lines. The units with less signs of concentrated flow are the *perpendicular terraces* and the *terraces with long natural talus*. The *steep terraces, long talus* unit favors the convergence of flow due to a combination of steep slope and the not completely perpendicularity of the terraces. The *terraces not completely perpendicular* unit is the one where more concentrated flow lines appear due to the channelization of water along the main longitudinal slope.The connectivity map was tested after one storm event on November 2006.

It can be concluded that defective terraces, which are not perpendicular to slope, act as fast runoff pathways. Local default in terraces seems increase the hydrological connectivity. Finally, higher connectivity is favoring the collapse of old reforestation terraces and the migration upstream of the drainage network.