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The impact of vegetation succession on soil parameters and its consequences for desertification remediation.

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Land abandonment is an important factor in Mediterranean landscapes. Abandoned fields often show increased erosion rates, which decline over time, depending on the rate of vegetation recovery. This latter factor is depending on climate and vegetation species but also on topographic position as well as soil type and soil surface properties.

For remediation of desertification it is important to establish the best conditions for vegetation development. This is not solely dependent on the amount of rainfall, the effectiveness of natural or artificial water harvesting and the suitability of the vegetation involved, but of primary importance is also the ability of soils to maintain ideal available water conditions for successful and sustainable vegetation establishment. Besides, those landscape spots should be selected that are most effective with regard to reduction of overland flow and erosion.

In our study a comparison is made of the impact of vegetation succession on essential soil properties along a soil gradient through the province of Murcia in Spain under similar semi-arid climate conditions. Vegetation cover and species development over a time series was compared to the development of soil properties on slates, marls, limestone and calcrete substratum. Furthermore, exposition (N or S) was incorporated in the comparison.

It was observed that N exposed slopes on slates showed a natural succession to full *Pi-*

nus halepensis forests within 40 years after abandonment, with a strong improvement of soil aggregation and macro-porosity. However, on S exposed slopes only 'matoral' (shrubland) developed in the same period. On the other extreme the marly soils showed no forest development over the same period on N exposed slopes, and although soil aggregation and macro-porosity also improved here, the regeneration of soil properties was much slower.

It can be concluded that vegetation succession strongly depends on exposition and soil type and that these parameters should be incorporated in remediation schemes using vegetation. Furthermore, simple indices such as the aridity index, often applied in revegetation programmes are insufficient alone, and can only be used when other site dependent environmental parameters are included.