



The importance of Soil Science to understand and remediate Land Degradation and Desertification processes

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Documentation is abundantly available to demonstrate the devastating effect of Land degradation and desertification on sustainable development in many countries. This presents a major barrier to achieving the UN Sustainable Development Goals by 2030, as agreed upon at the General Assembly of the UN in September 2015. Research has certainly been successful in reversing these two processes in many case studies but persistent problems remain not only in developing countries but also in developed countries where, for example, soil compaction and loss of soil organic matter due to the industrialization of agriculture, result in a structural decline of agricultural productivity and environmental quality. The problems are quite complex because not only technical matters play a role but also, and often quite prominently, socio-economic factors. What turns out to be successful remediation procedures at a given location or region, based on the characterization of underlying soil processes, will most likely not work in other regions inhibiting the extrapolation of local research results to areas elsewhere. One important reason for location specificity of research is the variation of soil properties in combination with the location of soils in a given landscape which governs its water, energy and nutrient dynamics, also considering the climate. Different soils are characterized by different natural risks for degradation and, in arid regions, desertification and their particular remediation potential differs widely as well. Such risks can sometimes be overcome by innovative soil management and knowing the soil type, the climate and landscape processes, extrapolation of such types of innovative management to comparable soils and landscapes elsewhere may be feasible and effective, provided that socio-economic conditions allow the required risk-reducing measures to be realized in practice. More cooperation between soil scientists and physical geographers, familiar with landscape processes, is therefore seen as a promising development in the continuing battle to reduce land degradation and desertification.

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