

Abstract

Soil Degradation Assessment in Europe, A Review of Status, Interaction and Remediation [†]

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Abstract: As soil formation is an extremely slow process, soil can be considered a non-renewable resource. Soils should thus be adequately protected and conserved to ensure that soil functions are not lost or diminished. Soil functions are, however, threatened by a wide range of processes. Europe's soil resources may continue to degrade due to changes in climate, land use and other human activities. The challenge is to prevent degradation and its adverse effects on soil functions and ecosystem services, and even improve the ability of soil to perform its functions. The soil degradation processes are complex and all parts of Europe are affected by one or more soil threats to some degree. There is a lack of knowledge on, a large uncertainty in, and lack of quantitative information on understanding the interrelationships between soil threats, soil threat and soil functions, and soil and ecosystem services. A major challenge in clarifying these relationships is how to integrate information and to analyse the key interactions. To bridge this gap, we have made an approach based on a review and expert knowledge to understand and describe those interrelations. This has been described in qualitative terms, and showed that the soil functions biomass production is affected by almost all threats, whereas the threat biodiversity decline has a major negative impact on all functions. It also showed that both soil biodiversity and soil erosion are more or less affected by almost all other soil threats. In the RECARE project, various prevention and remediation measures were trialed. Changes in manageable soil and other natural capital properties were measured and quantified, and a methodology to assess changes in ecosystem services was developed. Overall, the results showed positive on the impacts of the measures on ecosystem services. Although methodological challenges remain, the assessment served as an input to a stakeholder valuation of ecosystem services at local and sub-national levels. Although these activities are steps towards a soil remediation strategy, there is a need for further research on the mentioned issues in order to achieve an improved overview of existing information on soil degradation at the European scale, their interactions, and effects on ecosystem services. In addition, the lack of legally binding targets limits the impact that existing policies have on reducing soil threats and protecting soil function, although various EU policy instruments have shown positive impacts even in absence of binding targets for Member States.

Keywords: soil threats; soil functions; ecosystem services



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